ENHANCING NUCLEAR SAFETY:

Protecting Nuclear Power Plants Against Military Threats

A joint analysis by South African and Ukrainian experts of the Zaporizhzhia Nuclear Power Plant case to strengthen nuclear safety across African states

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Contents

Acronyms

AFRA – African Regional Cooperative Agreement for Research, Development and Training Related to Nuclear Science and Technology

AFCONE – African Commission on Nuclear Energy

AU – African Union

ChNPP – Chornobyl Nuclear Power Plant

CPPNM – Convention on the Physical Protection of Nuclear Material

CSR – Corporate Social Responsibility

CTBT – Comprehensive Nuclear-Test-Ban Treaty

FNRBA – Forum of Nuclear Regulatory Bodies in Africa

IAEA – International Atomic Energy Agency

ILO – International Labour Organisation

ISAMZ – IAEA Support and Assistance Mission to Zaporizhzhya

NPP – Nuclear Power Plant

NPT – Treaty on the Non-Proliferation of Nuclear Weapons

UNGA – United Nations General Assembly

UNSC – United Nations Security Council

ZNPP – Zaporizhzhia Nuclear Power Plant

Executive Summary

The African Union recognises nuclear energy as an important factor for the industrialisation and socio-economic development of the continent. Over 16 African countries are progressing with nuclear programmes at varying stages. As a high-risk technology, nuclear energy requires robust safety and security regulations to ensure its safe and effective operation. Rising geopolitical instability is undermining nuclear safety frameworks, requiring immediate and coordinated action to safeguard the African continent.

In 2022, Russia's invasion of Ukraine resulted in the first military occupation of an operational nuclear power plant, exposing gaps in existing norms and setting a dangerous precedent that lowers the threshold for nuclear safety violations.

Africa has a proud track record of leadership in non-proliferation, nuclear safety, and the peaceful use of nuclear energy as established by the African Nuclear-Weapon-Free Zone Treaty (Pelindaba Treaty). Article 11 of this Treaty prohibits armed attacks on nuclear installations.

This document analyses the occupation of, and attacks on the Zaporizhzhia Nuclear Power Plant (ZNPP)[1] — Europe's largest nuclear facility and one of the world's ten largest nuclear power plants, consisting of six reactors with a total capacity of 6,000 MW —under ongoing occupation since March 2022.

This analysis suggests that the provisions of the Pelindaba Treaty may not fully address the complex risks posed to nuclear safety and security in contemporary armed conflicts. Based on this assessment, the document identifies key areas where regulation should be strengthened to enhance nuclear safety and security across the African continent:

- **developing internationally binding regulations**, supported by enforcement mechanisms, to effectively **prevent the military occupation** of, or armed attacks on, nuclear facilities;
- **expanding the IAEA's mandate** to monitor and ensure nuclear safety and security;
- **safeguarding nuclear-related infrastructure** that may not be formally classified as nuclear installations;
- **upholding and protecting labour and human rights,** ensuring physical safety and psychological well-being **of nuclear personnel and operators,** particularly in the case of occupation;
- **strengthening corporate responsibility and accountability frameworks for nuclear operating companies** to ensure compliance with safety, security, and human rights standards across jurisdictions.

1 This document uses the spelling of the Ukrainian city and region "Запоріжжя" as Zaporizhzhia, in accordance with Ukraine's official transliteration system approved by the Cabinet of Ministers of Ukraine (Resolution No. 55, 27 January 2010) and the Executive Committee of the Zaporizhzhia City Council Resolution (28 August 2017, № 476). It also uses Zaporizhzhia Nuclear Power Plant as per UNGA Resolution from 11 July 2024. The term 'Zaporizhzhya Nuclear Power Plant' follows the usage of the International Atomic Energy Agency (IAEA) in its official documents. Russian authorities use the Russian-language transliteration "Zaporozhye". The spelling is retained in quotations from the original sources.

Governments bear the critical responsibility to strengthen existing regulations; until they do, nuclear safety and security remain at risk worldwide. This document urgently calls on all governments and other stakeholders to take immediate, concrete action to prevent further threats to nuclear safety and security across the globe.

This document has been developed through a partnership between South African and Ukrainian experts from the South African Institute of International Affairs, Ilko Kucheriv Democratic Initiatives Foundation, the Ukrainian Association of South Africa and Dixi Group. It draws upon the policy brief "*Nuclear Safety During the Military Invasion: A Case Study of the Ukraine–Russia Conflict*," which was presented on the margins of the 2024 African Union Mid-Year Coordination Meeting in Accra. Elements of that brief have been refined, expanded, and incorporated into the present analysis. All information contained in this document is current as of June 2025.

Isandla esiphambili asibuyeli emuva

isiZulu proverb (The hand that leads does not turn back)

Man is condemned to be free; because once thrown into the world, he is responsible for everything he does.

Jean-Paul Sartre

1. INTRODUCTION

The growing demand for energy on the African continent means that all safe options should be explored. The African Union regards nuclear energy as one of the decarbonised options for sustainable development.[2]

As of 2025, the only operational nuclear power plant on the continent is the two reactors of the Koeberg plant in South Africa with a combined capacity of 1.9 GW. More than 16 African countries are exploring the possibility of incorporating nuclear technology into their energy mix. Of these, Egypt is the closest to joining the nuclear club, with the construction of its first nuclear power plant, Al Dabaa — a 4.8 GW facility supported by the Russian State Nuclear Energy Corporation, Rosatom — expected to be completed by 2030.[3]

1.1. Nuclear Safety Challenges in a Militarised Environment

While nuclear energy is distinct from nuclear weapons, a nuclear reactor is embedded within the broader nuclear fuel cycle and, therefore, within the political, social, and environmental contexts that shape it. The technological connection between the two means that states can use NPPs to project political influence, so-called 'political posturing'.[4]

Nuclear technology is inherently tied to geopolitical tensions and cannot be viewed in isolation from them. Recognising nuclear infrastructure as part of a wider socio-political system is essential to understanding its governance, security, and long-term implications. This makes it critical that nuclear safety and security regulations are not compromised.

2 AU. Africa Speaks with Unified Voice as AU Executive Council Adopts African Common Position on Energy Access and Just Energy Transition, 22 July 2022. https://au.int/en/pressreleases/20220722/africa-speaks-unified-voice-au-executive-council-adopts-african-common

3 Power Technology, 'El Dabaa Nuclear Power Plant', 14 July 2023.

4 Kachur, D. & Foley, R. (2024). *African Agency: The Case of Russian Nuclear Programmes in Egypt, Ghana, South Africa and Zambia.* In: S. Botha & J. van Wyk (Eds.), Key Issues in African Diplomacy (pp. 196–220). Bristol University Press. https://doi.org/10.51952/9781529222593.ch014

1.2. Why the ZNPP Case Matters

Firstly, the occupation of the ZNPP in 2022 marked the first time in history that a fully **operational nuclear power** facility, containing a significant inventory of irradiated fuel, was **directly targeted and militarily occupied**. Prior to this, no precedent existed. Ukraine operates four nuclear power plants and oversees the decommissioning and radiation safety of the Chornobyl Nuclear Power Plant (ChNPP). All nuclear facilities in Ukraine face potential attacks, as drones and missiles target locations across the country, with several sites already affected to varying degrees.

While earlier military actions involving nuclear infrastructure—such as the Israeli airstrike on Iraq's Osirak reactor in 1981, the missile strike on Iran's Bushehr NPP in 1987, and the threat to Slovenia's Krško NPP during the Yugoslav Wars in 1991—were relatively isolated, the ZNPP remains **on the frontline for over three years**. This highlights **a gap in international legal protections, the inability of the International Atomic Energy Agency** (IAEA) **to ensure nuclear safety and security, and a lack of political will** to prevent or resolve such situations.

Secondly, the attack and occupation of ZNPP by the Russian Federation, a **nuclear-weapon state,** constitutes the first instance of such a state **attacking a country that had voluntarily relinquished its nuclear arsenal** and joined the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) as a non-nuclear-weapon state. In 1994, under the Budapest Memorandum on Security Assurances, Ukraine gave up the world's third-largest nuclear arsenal in exchange for security assurances from Russia, the United States, and the United Kingdom regarding its territorial integrity and sovereignty[5]. Such actions weaken the non-proliferation and disarmament movement, blur the line between peaceful and military nuclear use, and **reinforce the belief that nuclear weapons are essential to ensure sovereignty.**

Thirdly, nuclear personnel have faced serious human rights violations — including torture, psychological coercion, and denial of shift rotations — all of which endanger nuclear safety[6]. These violations occurred in the presence of, and with the knowledge of, Rosatom representatives,[7] raising serious **questions** about **the corporate responsibility and complicity of Russian state-owned enterprises.**

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5 UN Treaties. Memorandum on security assurances in connection with Ukraine's accession to the Treaty on the Non-Proliferation of Nuclear Weapons. December 1994 https://treaties.un.org/doc/Publication/UNTS/Volume%203007/v3007.pdf

6 ILO (2025) Developments in the application of the resolution concerning the Russian Federation's aggression against Ukraine from the perspective of the mandate of the International Labour Organisation. GB.354/INS/6. Geneva: International Labour Organisation. https://www.ilo.org/sites/default/files/2025-05/GB354-INS-6-%5BEUROPE-250508-001%5D-Web-EN.pdf

7 Truth Hounds (2023) *In A Nuclear Prison: How Rosatom Turned Europe's Largest Nuclear Power Plant into a Torture Chamber and How Can The World Stop It.* *https://truth-hounds.org/en/cases/in-a-nuclear-prison-how-rosatom-turned-europes-largest-nuclear-power-plant-into-a-torture*-chamber-and-how-can-the-world-stop-it/

1.3. Strengthening Regulatory Mechanisms to Address Nuclear Safety Challenges

Radiation is non-discriminatory—it affects all people and environments, regardless of borders, nationality, or political alignment.

Major nuclear accidents such as the Chornobyl disaster in Ukraine (1986) and the Fukushima incident in Japan (2011) prompted significant transformation in international nuclear safety norms.

The fallout from the Chornobyl disaster, which extended far beyond Ukraine to North Africa, Japan, China, and North America, underscored the transboundary nature of radiation. As a result, greater investment in safety culture globally, was introduced along with public participation processes. The Fukushima accident highlighted the importance of supporting infrastructure and cooling systems. In response, countries around the world conducted “stress tests” to enhance their nuclear safety measures.

The construction of a nuclear power plant in Egypt, near an area of ongoing military conflict, highlights the urgent need for African states to ensure the protection of nuclear facilities during armed conflicts. While the Pelindaba Treaty provides a foundational governance framework—emphasising non-proliferation, safety, and the peaceful use of nuclear energy—there remains a critical need to address the diverse risks posed to nuclear infrastructure in conflict settings.

The case of occupation of operational nuclear facilities requires urgent political leadership to strengthen global nuclear safety frameworks.

2. The Zaporizhzhia NPP Occupation Case: Legal and Governance Challenges

This section presents key facts about the military takeover of the ZNPP and the international efforts to regulate this complex matter.

2.1. Military Seizure of a Nuclear Power Plant

ZNPP, located in southern Ukraine, has six Soviet-designed VVER-1000/320 reactors with a total capacity of 6 GW. Before the Russian invasion, ZNPP supplied approximately 27% of Ukraine's electricity,[8] amounting to around 155.72 terawatt-hours (TWh) in 2021.[9] The strategic location of ZNPP makes it vital for energy supply to different regions of Ukraine, including Crimea and the Donetsk region.

The city of Enerhodar, where the ZNPP is located, was forcibly seized by Russian military forces on 4 March 2022, despite civilian protests [Photo 1]. The Russian army failed to occupy the whole Zaporizhzhia region and as of June 2025, when this document is written. It controls about 70 % of Zaporizhzhia region territory.[10] Thus, the city of Enerhodar and ZNPP remain on the front line [Figure 1].

Photo 1. Ukrainian civilians blocking the road to the ZNPP aiming to prevent Russian occupation. Source: Ukrainska Pravda[11]

8 Zaporizhzhia NPP. Energoatom. 2022 https://energoatom.com.ua/en/branch/zaporizka-aes
9 IEA. Energy System of Ukraine as of May 2025 https://www.iea.org/countries/ukraine
10 ISW. Interactive Map: Russian Invasion of Ukraine https://storymaps.arcgis.com/stories/36a7f6a6f5a9448496de641cf64bd375 As of April 2025
11 Ukrainska Pravda, "Energodar residents form their city's wall of defence", https://www.pravda.com.ua/eng/news/2022/03/2/7327506/

Since September 2022, the plant has been in a cold shutdown mode. On 5 October 2022, following Russia's illegal declaration of the Zaporizhzhia region as part of its territory, a presidential decree unilaterally appropriated the nuclear plant and declared it Russian state property.[12] Control of the ZNPP has been handed over to Russia's state nuclear corporation, **Rosatom**, and its regulator, **Rostekhnadzor**, through the newly established joint-stock company (JSC) Zaporozhye NPP Operational Organisation.[13]

While ZNPP currently remains in a cold shutdown, Russian officials have declared a plan to restart it,[14] raising urgent safety concerns.[15]

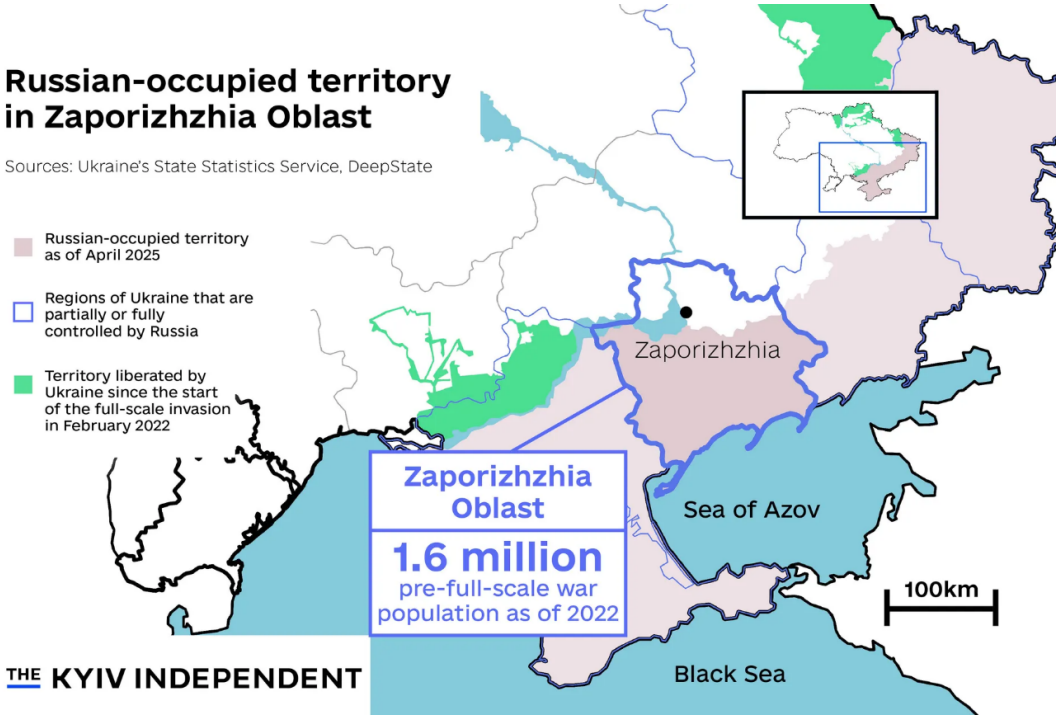

Figure 1. Map of Ukraine's Zaporizhzhia Oblast [16]

12 Decree of the President of the Russian Federation dated 05.10.2022 No. 711. Kremlin http://www.kremlin.ru/acts/bank/48370

13 Decree of the President of the Russian Federation No. 711. On the Specifics of Legal Regulation in the Sphere of the Use of Atomic Energy on the Territory of Zaporozhie Region. of 5 October 2022, http://www.kremlin.ru/acts/bank/48370

14 Rosatom announced preparations for the restart of the Zaporizhia NPP. Izvestiia. 6 June 2025, https://en.iz.ru/en/1899567/2025-06-06/rosatom-announced-preparations-restart-zaporizhia-npp

15 Murphy F., IAEA's Grossi says it's far from safe to restart Zaporizhzhia nuclear plant. Reuters. 3 June 2024, https://www.reuters.com/business/energy/iaeas-grossi-says-its-far-safe-restart-zaporizhzhia-nuclear-plant-2024-06-03/

16 Map image by Nizar al-Rifai, The Kyiv Independent, used in 'What to know about the 5 'key territories' at the heart of Ukraine peace talks', 18 April 2025. https://kyivindependent.com/what-to-know-about-the-5-key-territories-at-the-heart-of-ukraine-peace-talks/

2.2. Violations of Ukraine's Territorial Integrity and the Arguments Used for Annexation

The arguments used for changing the ownership of ZNPP was a 10-day sham referendum organised by Russian military authorities. **The UNGA adopted Resolution A/RES/ES-11/4 on 12 October 2022, condemning the Russian Federation's organisation of the so-called referendums** in regions within Ukraine's internationally recognised borders and explicitly declared the referendums to be illegal and invalid, reaffirming Ukraine's sovereignty over its entire territory.[17] **The resolution was passed with 143 votes in favour,** 5 against, and 35 abstentions. The UNGA resolution was a response to Russia's veto in the UN Security Council on 30 September 2022, which blocked a resolution declaring the disputed referendums and subsequent annexation illegal under international law.[18]

None of the African states voted against the resolution on territorial integrity of Ukraine A/RES/ES-11/4, supporting the UN Charter and condemning the so-called referendums organised by Russia. The sham referendums started on 20 September 2022, when Russian-appointed authorities—rather than democratically elected local representatives—announced so-called referendums in the occupied territory. Despite ongoing hostilities, widespread displacement, and the absence of documentation or established election procedures, the Kremlin proclaimed the annexation of the entire region just 10 days later, on 30 September 2022.[19]

Notably, the city of Zaporizhzhia, home to approximately 45% of the region's population (710,000 of 1.6 million), has never been occupied and did not participate in the so-called referendum.[20] Nevertheless, Russia unilaterally incorporated the entire region into its constitution, in contravention of international law. Within a span of just ten days, the Russian authorities declared Ukraine's Zaporizhzhia region, including the Zaporizhzhia Nuclear Power Plant, as part of Russian territory.

17 UNGA Resolution. Territorial integrity of Ukraine: defending the principles of the Charter of the United Nations. A/RES/ES-11/4. 12 October 2022 https://docs.un.org/en/A/RES/ES-11/4
18 UN News. Russia vetoes Security Council resolution condemning attempted annexation of Ukraine regions. 30 September 2022 https://news.un.org/en/story/2022/09/1129102
19 President of Russia. Signing of treaties on accession of Donetsk and Lugansk people's republics and Zaporozhye and Kherson regions to Russia. 30 September 2022 http://en.kremlin.ru/events/president/news/69465
20 Statistics Ukraine. Number of Present Population of Ukraine, as of January 1, 2022. http://db.ukrcensus.gov.ua/PXWEB2007/ukr/publ_new1/2022/zb_%D0%A1huselnist.pdf

2.3. Peace Negotiations for Ukraine and ZNPP

Nuclear safety and the occupation of the ZNPP are central issues in peace negotiations between Russia and Ukraine. However, despite the diversity of proposals, neither the ongoing occupation nor the threat of military attacks on the nuclear facility has been resolved. The main proposals concerning the future of ZNPP are listed below.

The Ukraine Peace Formula announced by President Volodymyr Zelenskyy during the G20 Bali Summit in November 2022 includes nuclear safety. "Radiation and nuclear safety", focusing on restoring security around Europe's largest nuclear power plant[21], Zaporizhzhia in Ukraine" is the first out of 10 proposed points.[22] The Ukraine Peace Formula was further approved at the Global Peace Summit in Switzerland in June 2024, where it was signed by over 90 countries, including numerous representatives from the African continent. The Summit Communique states: "Ukrainian nuclear power plants and installations, including the Zaporizhzhia Nuclear Power Plant, must operate safely and securely under full sovereign control of Ukraine and in line with IAEA principles and under its supervision. Any threat or use of nuclear weapons in the context of the ongoing war against Ukraine is inadmissible."[23]

In Russian understanding, ZNPP is in its full ownership and operational control. Russia deems joint operation with Ukraine or any other country inadmissible due to safety concerns. In its demands during the Russia-Ukraine peace negotiations, Russia stipulated that Ukraine would voluntarily withdraw completely from the Donetsk, Luhansk, Zaporizhzhia and Kherson regions, which Russia cannot occupy militarily, but claims as its own territory.[24] In the view of the Russian authority, the ownership of ZNPP is fully formalised through a Russian presidential decree on October 5, 2022.

China proposed a 12-point peace plan, announced in February 2023, that includes a point on nuclear safety: 'Keeping Nuclear Power Plants Safe', maintaining that all sides should comply with international nuclear safety standards and avoid military activities near nuclear facilities.[25]

The China-Brazil 6-point proposal of May 2024 also demanded that "Attacks on nuclear power plants and other peaceful nuclear facilities must be opposed. All parties should comply with international law including the Convention on Nuclear Safety and resolutely prevent man-made nuclear accidents."[26]

21 Charlie King, 'Top 10 Nuclear Power Plants', *Energy Digital*, 13 September 2023, https://energydigital.com/top10/top-10-nuclear-power-plants.
22 Ukraine's Peace Formula Philosophy, https://www.president.gov.ua/storage/j-files-storage/01/19/53/32af8d644e6cae41791548fc82ae2d8e_1691483767.pdf
23 Summit on Peace in Ukraine: Joint Communiqué on a Peace Framework. FDFA. 16 June 2024 https://www.eda.admin.ch/eda/en/fdfa/fdfa/aktuell/dossiers/konferenz-zum-frieden-ukraine/Summit-on-Peace-in-ukraine-joint-communique-on-a-peace-framework.html
24 The Moscow Times. What's Russia Demanding in Its Peace Memorandum to Ukraine? 2 June 2025 https://www.themoscowtimes.com/2025/06/02/whats-russia-demanding-in-its-peace-memorandum-to-ukraine-a89307
25 Ministry of Foreign Affairs People's Republic of China. *China's Position on the Political Settlement of the Ukraine Crisis.* 24 February 2024. https://www.fmprc.gov.cn/eng/xw/zyxw/202405/t20240530_11331711.html
26 Federal Government of Brazil. *Brazil and China present joint proposal for peace negotiations with the participation of Russia and Ukraine*. 23 May 2024 https://www.gov.br/planalto/en/latest-news/2024/05/brazil-and-china-present-joint-proposal-for-peace-negotiations-with-the-participation-of-russia-and-ukraine

United States President Donald Trump has made multiple attempts to find solutions for ending the Russian-Ukrainian war. A proposal was also made in March 2025 to address the challenges surrounding the ZNPP, raising complex questions regarding the plant's ownership and control. The White House briefing published on that matter states that "the United States could be very helpful in running [Ukraine's power] plants with its electricity and utility expertise. American ownership of those plants would be the best protection for that infrastructure and support for Ukrainian energy infrastructure.[27] Since the ZNPP remains under Russian occupation, any proposed transfer of oversight, especially to a foreign power, raises significant legal, political, and sovereignty concerns.

Africa Peace Mission to Ukraine and Russia (June-July 2023) that included leaders from the Comoros, Congo-Brazzaville, Egypt, Senegal, South Africa, Uganda, and Zambia, was the first Peace Mission of African states addressing a non-African conflict. The African Peace Mission has not specifically addressed nuclear safety, but it references the principle of territorial integrity, stating that 'the sovereignty of countries, in accordance with the UN Charter and internationally recognised principles, should be respected.' [28]

2.4. UN Resolution on the Occupation of ZNPP

On 11 July 2024, the **UNGA Resolution A/RES/78/316**[29], adopted by 99 votes in favour, addressed specific matters of ZNPP occupation:

- **demanded that the Russian Federation immediately return full control of the Zaporizhzhia Nuclear Power Plant to Ukrainian authorities,** emphasising the importance of nuclear safety and security;
- **called on Russia to provide the IAEA mission with full and timely access to all areas of the plant** essential for nuclear safety and security, condemning Moscow's failure to implement relevant UN and IAEA resolutions.

While many proposals for the peace negotiations reference the IAEA Convention on Nuclear Safety, interpretations of the practical steps required for its implementation may vary. The adopted UNGA resolution outlines specific measures for regulating the ZNPP occupation, but is not legally binding and therefore cannot be enforced. Moreover, the IAEA monitoring mission is restricted to locations and times that are allowed by the Russian authorities.

27 The White House Briefings and Statements. *Statement from Secretary Rubio and NSA Waltz on Call with Zelenskyy*. 19 March 2025 https://www.whitehouse.gov/briefings-statements/2025/03/statement-from-secretary-rubio-and-nsc-waltz-on-call-with-zelenskyy/

28 Masuabi Q. Ramaphosa meets Putin and presents 10-point plan to end war between Ukraine and Russia, 18 June 2023 https://www.dailymaverick.co.za/article/2023-06-18-ramaphosa-presents-10-point-african-plan-to-end-russia-ukraine-war/

29 UNGA Resolution A/RES/78/316, titled "Safety and security of nuclear facilities of Ukraine, including the Zaporizhzhia Nuclear Power Plant", adopted by the 78th session of the General Assembly on 11 July 2024. https://docs.un.org/en/A/RES/78/316.

3. International and African Frameworks for Regulating and Responding to the Military Invasion of Nuclear Facilities

This section analyses the existing international and continental frameworks that can be applicable to the military occupation of a nuclear power plant.

African countries on the whole display significant support for the global nuclear governance regime. At the continental level, home-grown nuclear governance frameworks also receive high levels of support. Nuclear energy is seen as an important stimulant for development, a view that underpins the interest of states and the continental body, the African Union, in nuclear energy.

African countries promote and widely support the Treaty on the Non-Proliferation of Nuclear Weapons (NPT). Through the Pelindaba Treaty, Africa's firm stance against nuclear weapons but in favour of the peaceful uses of nuclear energy is fully expressed. The peaceful uses of nuclear energy in Africa are further promoted by the African Regional Cooperation Agreement for Research, Training and Development Related to Nuclear Science and Technology (AFRA), in force since 1990,[30] and the Forum of Nuclear Regulatory Bodies in Africa (FNRBA), founded in 2009.[31] The table below captures the international and continental instruments to which African states subscribe and explains their relevance to the current context.

Table 1. Assessment of Global and African Nuclear Regulatory Frameworks for the ZNPP Case[32]

Framework Name	Date Enforced	No. of African signatories/parties to the treaty	Applicable or non-applicable to the situation	Important parts of the text
Treaty on the Non-Proliferation of Nuclear Weapons (NPT)	1970	53 (states parties)	Applicable. Because the NPT provides for the right of states to use nuclear energy for peaceful purposes (which includes nuclear power), the peaceful uses should be guarded and nuclear installations should not be placed at risk in armed conflict.	Article IV – "1. Nothing in this Treaty shall be interpreted as affecting the inalienable right of all the Parties to the Treaty to develop research, production and use of nuclear energy for peaceful purposes without discrimination and in conformity with Articles I and II of this Treaty.

30 AFRA, 'Who we are', https://www.afra-web.org/who-we-are.
31 Jo-Ansie van Wyk, Yarik Turianskyi and Isabel Bosman, 'African Continental Nuclear Institutions: A Review', SAIIA Policy Insights No 119, October 2021, https://saiia.org.za/wp-content/uploads/2021/11/Policy-Insights-119-van-wyk-turianskyi-bosman.pdf.

				2. All the Parties to the Treaty undertake to facilitate, and have the right to participate in, the fullest possible exchange of equipment, materials and scientific and technological information for the peaceful uses of nuclear energy." [32.1]
Convention on the Physical Protection of Nuclear Material (CPPNM)	1987	45 (states parties) *Russian Federation withdrawn; Poland withdrawn; Mongolia withdrawn; Hungary withdrawn; Bulgaria withdrawn* [32.2] *EURATOM is party to this convention as are several European states*.	The CPPNM links to the argument made above, that the right to peaceful uses of nuclear energy demands protection of nuclear installations. The preamble of the text, for example, begins as follows: "Recognising the right of all States to develop and apply nuclear energy for peaceful purposes and their legitimate interests in the potential benefits to be derived from the peaceful application of nuclear energy…"[32.3] But it is not applicable to the situation in Ukraine because it does not cover "nuclear materials used for military purposes or to those used for peaceful purposes but not in international transport". [32.4]	Article 2(2) – "With the exception of articles 3 and 4 and paragraph 3 of article 5, this Convention shall also apply to nuclear material used for peaceful purposes while in domestic use, storage and transport."[32.5] Article 3 – "Each State Party shall take appropriate steps within the framework of its national law and consistent with international law to ensure as far as practicable that, during international nuclear transport, nuclear material within its territory, or on board a ship or aircraft under its jurisdiction insofar as such ship or aircraft is engaged in the transport to or from that State, is protected at the levels described in Annex I." [32.6] Article 5(2) – "In the case of theft, robbery or any other unlawful taking of nuclear material or of credible threat thereof. States Parties shall, in accordance with their national law, provide co-operation and assistance to the maximum feasible extent in the recovery and protection of such material to any State that so requests."[32.7] (The CPPNM, as a whole, is applicable but these articles stand out).

Africa Nuclear Weapon-Free Zone Treaty (Treaty of Pelindaba) *Established under the Treaty of Pelindaba is the African Commission on Nuclear Energy (AFCONE), the oversight and implementation body for the Treaty.*	2009	52 signatories; 42 ratifications [32.8]	Instructive	Articles 8 & 9 relate to the peaceful uses of nuclear energy and mandate engagement with the IAEA.[32.9] *Instructive articles contained in the Treaty of Pelindaba:* Article 10: member states are called upon to "maintain the highest standards of security and effective physical protection of nuclear materials, facilities, and equipment to prevent unauthorised theft or unauthorised use and handling". [32.10] **Article 11. *Prohibition of Armed Attack on Nuclear Installation* –** "Each Party undertakes not to take, assist, or encourage any action aimed at an armed attack by conventional or other means against nuclear installations in the African Nuclear-Weapon-Free-Zone". [32.11]
Comprehensive Nuclear Test Ban Treaty (CTBT)	Insufficient ratifications	50 ratifications; 2 signatures; 2 no action taken. [32.12]	Not applicable.	
Amendment to the CPPNM	2016	33 ratifications/ acceptance	Amendments to the CPPNM do not cover armed attacks specifically. Rather, it covers acts of sabotage and the protection of nuclear material in-use and in storage.	Under the amendment, Paragraph 1 of Article 7 of the CPPNM is to be replaced with the following text: "The intentional commission of…

				(e) an act directed against a nuclear facility, or an act interfering with the operation of a nuclear facility, where the offender intentionally causes, or where he knows that the act is likely to cause, death or serious injury to any person or substantial damage to property or to the environment by exposure to radiation or release of radioactive substances, unless the act is undertaken in conformity with the national law of the State Party in the territory of which the nuclear facility is situated…shall be made a punishable offence by each State Party under its national law". [32.13]
International Convention for the Suppression of Acts of Nuclear Terrorism	2007		Not applicable	Acts of nuclear terrorism are criminalised, but the Treaty does not cover armed conflict in its provisions. According to Article 4: "The activities of armed forces during an armed conflict, as those terms are understood under international humanitarian law, which are governed by that law are not governed by this Convention, and the activities undertaken by military forces of a State in the exercise of their official duties, inasmuch as other rules of international law govern them, are not governed by this Convention". [32.14]

32.1 United Nations, 'Treaty on the Non-Proliferation of Nuclear Weapons', 1 July 1968, https://treaties.unoda.org/t/npt.
32.2 International Atomic Energy Agency (IAEA), 'Convention on the Physical Protection of Nuclear Material', Status, 18 September 2024, https://www.iaea.org/sites/default/files/22/06/cppnm_status.pdf.
32.3 International Atomic Energy Agency (IAEA), 'The Convention on the Physical Protection of Nuclear Material', IAEA-INF CIRC/274/Rev.1, https://www.iaea.org/sites/default/files/infcirc274r1.pdf, 1.
32.4 NTI, CPPNM.
32.5 IAEA, 'Convention on the Physical Protection of Nuclear Material', 2.
32.6 IAEA, 'Convention on the Physical Protection of Nuclear Material", 2.
32.7 IAEA, 'Convention on the Physical Protection of Nuclear Material', 3.
32.8. Jo-Ansie van Wyk and Yarik Turianskyi, 'The Nuclear Weapons Ban Treaty: An African Perspective', SAIIA Policy Insights 104, May 2021, https://saiia.org.za/wp-content/uploads/2021/06/Policy-Insights-104-van-wyk-turianskyi.pdf.
32.9 The African Nuclear Weapon Free-Zone Treaty, April 11, 1996, https://au.int/sites/default/files/treaties/37288-treaty-0018_-_the_african_nuclear-weaponfree_zone_treaty_the_treaty_of_pelindaba_e.pdf
32.10 The Treaty of Pelindaba, Article 10: 7.
32.11 The Treaty of Pelindaba, Article 11: 7.
32.12 CTBTO, 'Status of Signature and Ratification', https://www.ctbto.org/our-mission/states-signatories?f%5B0%5D=region_taxonomy_term_name%3AAfrica.
32.13 IAEA, 'Amendment to the Convention on the Physical Protection of Nuclear Material', INFCIRC/274/Rev.1/Mod.1 (Corrected)', 18 October 2021, https://www.iaea.org/sites/default/files/publications/documents/infcircs/1979/infcirc274r1m1c.pdf.
32.14 Nuclear Energy Agency (NEA), 'International Convention for the Suppression of Acts of Nuclear Terrorism (Nuclear Terrorism Convention or ICSANT)', *International Conventions and Agreements: Nuclear Law*, no date, https://www.oecd-nea.org/jcms/pl_29143/international-convention-for-the-suppression-of-acts-of-nuclear-terrorism-nuclear-terrorism-convention-or-icsant.

The legal instruments highlighted in Table 1 are all examples of treaty law. With the exception of the Treaty of Pelindaba, the protection of nuclear facilities against armed attack is notably absent in treaty law. However, customary law makes provision for this in the additional protocols to the Geneva Conventions and the Rules of International Humanitarian Law.[33]

33 See Bosman, I., 'Legal Protection for Zaporizhzhia Nuclear Power Plant'. Policy Briefing 281, SAIIA, October 2023 https://saiia.org.za/wp-content/uploads/2023/11/SAIIA_PB-281_LegalProtectionZNPP.pdf

Table 2. Customary Law on Nuclear Regulation Applicable for the ZNPP Case[34]

Rule 42 (Rules of International Humanitarian Law)	"Particular care must be taken if works and installations containing dangerous forces, namely dams, dykes and nuclear electrical generating stations, and other installations located at or in their vicinity are attacked, in order to avoid the release of dangerous forces and consequent severe losses among the civilian population". [34.1]
Art. 56 (1) – Additional Protocol I to the Geneva Conventions and Article 15 of Additional Protocol II to the Geneva Conventions	"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. Other military objectives located at or in the vicinity of these works or installations shall not be made the object of attack if such attack may cause the release of dangerous forces from the works or installations and consequent severe losses among the civilian population".[34.2]

34.1 Rules of International Humanitarian Law, 'Rule 42. Works and Installations Containing Dangerous Forces', International Humanitarian Law Databases, International Committee of the Red Cross, https://ihl-databases.icrc.org/en/customary-ihl/v1/rule42.

34.2 Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), 'Article 56 – Protection of works and installations containing dangerous forces', 8 June 1977, https://ihl-databases.icrc.org/en/ihl-treaties/api-1977/article-56?activeTab=undefined ; see also Bosman, I., 'Legal protection for Zaporizhzhia Nuclear Power Plant'.

Resolutions stemming from the IAEA General Conference also cover the safety of nuclear facilities [Table 3].

Table 3. IAEA General Conference covering the safety of nuclear facilities that address potential armed attack on the NPP[35]

GC(XXVII)/RES/407 (1983)[35.1]	Safety principles throughout the nuclear life cycle for nuclear facilities and protection of workers, the environment and populations in the vicinity of nuclear installations.
GC(XXIX)/RES/444 (1985)[35.2]	Nuclear safety requirements when working with the processing, storage and transportation of nuclear material.
GC(XXX3)/RES/475 (1987)[35.3]	Safety requirements relating to the production and use (storage, processing and transporation) of nuclear material.

GC (XXXIV)/RES/533 (1990)[35.4]	Safety protocols related to nuclear waste disposal (storage, processing and transportation).
GC(53)/DEC/13 (2009)[35.5]	Safety requirements related to the storage, processing and transportation of nuclear material.
GC(XXXIV)/RES/533	Relates directly to armed attack on nuclear facilities. The resolution states that: "The General Conference…aware of the fact that an armed attack on a nuclear installation could result in radioactive releases with grave consequences within and beyond the boundaries of the State which has been attacked, convinced of the need to prohibit armed attacks on nuclear installations from which such releases could occur and of the urgency of concluding an international agreement in this regard, and aware of the ongoing work of the Conference on Disarmament with a view to concluding an international agreement in this regard, 1. Recognizes that attacks or threats of attack on nuclear facilities devoted to peaceful purposes could jeopardize the development of nuclear energy; 2. Considers that the safeguards system of the Agency is a reliable means of verifying the peaceful uses of nuclear energy; 7. Urges all States to cooperate in achieving a successful resolution of the issue in the near future". [35.6]

35.1 IAEA, Resolutions and other decisions of the General Conference, XXVII General sessions 10-14 October 1983 https://share.google/pBQKZXiH2RkeYDnV3

35.2 IAEA, Protection of nuclear installations devoted to peaceful purposes against armed attacks, XXIX General conference 27 September 1985 https://www.iaea.org/sites/default/files/gc/gc29res-444_en.pdf.

35.3 IAEA, Measures to strengthen international co-operation in nuclear safety and radiological protection, XXXI General conference 5 October 1987 https://www.iaea.org/sites/default/files/gc/gc31res-475_en.pdf.

35.4 IAEA, Measures to strengthen international co-operation in matters relating to nuclear safety and radiological protection, XXXIV General conference October 1990 https://www.iaea.org/sites/default/files/gc/gc34res-533_en.pdf.

35.5 IAEA, Prohibition of armed attack or threat of attack against nuclear installations, during operation or under construction, GC(53), September 2009 https://www.iaea.org/sites/default/files/gc/gc53dec-13_en.pdf.

35.6 IAEA, Measures to strengthen international co-operation in matters relating to nuclear safety and radiological protection: prohibition of all armed attacks against nuclear installations devoted to peaceful purposes, whether under construction or in operation. Resolution adopted at the 332nd plenary meeting, 21 September 1990. https://www.iaea.org/sites/default/files/gc/gc34res-533_en.pdf.

The previous section shows clearly that nuclear safety during armed attack is an international concern reflected in several legal mechanisms. However, implementation and upholding of these principles is lacking.

4. Other unregulated challenges that ZNPP case raised

The occupation of ZNPP shows that beside the military attack on the nuclear installation itself, there are other challenges that need to be regulated to ensure nuclear safety and security. This section outlines these key challenges.

4.1. Limited Mandate of the IAEA in Ensuring Nuclear Safety

The IAEA provides guidance, peer reviews, and recommendations, but national governments retain ultimate responsibility for the safe operation of nuclear facilities. Thus, the IAEA is limited in what it can do to ensure nuclear safety.

Although the ZNPP was occupied on 4 March 2022, the IAEA Support and Assistance Mission to Zaporizhzhya (ISAMZ) commenced its operations only six months later, on 1 September 2022, following protracted negotiations and the eventual permission granted by the Russian authorities. Currently, **the ISAMZ mission's access is limited to areas approved by the Russian authorities**, restricting its ability to comprehensively verify compliance and monitor all equipment.[36]

Several acts of aggression against the ZNPP have been recorded by ISAMZ.[37] In September 2022, the IAEA issued a report on the nuclear facilities in Ukraine which concluded that **the occupation of the plant compromised all seven indispensable pillars for ensuring nuclear safety and security**.[38] The violations include the presence of troops, military equipment and weapons on-site [Photo 2], mining the perimeter around ZNPP, lack of personnel rotation or compromised monitoring and reporting processes.

In May 2023, the IAEA Director General Rafael Grossi proposed and the UNSC further endorsed **five concrete principles to safeguard nuclear safety during armed conflict**.[39] Recommended actions included establishing a safety protection zone around the plant without military equipment and implementing shifts of nuclear safety inspectors. Despite efforts, the demilitarised safety protection zone was not achieved.

The IAEA is constantly innovating on how nuclear safety can be ensured. However, international organisations can only provide recommendations, while the governments of countries can make decisions and act on them. If international regulations remain non-binding, states may contravene nuclear safety principles without facing legal consequences or enforcement mechanisms.

36 IAEA Update 206 – IAEA Director General Statement on Situation in Ukraine
37 Grossi R. Nuclear Safety, Security and Safeguards in Ukraine. GOV/2025/26. 2 June 2025 https://www.iaea.org/sites/default/files/documents/gov2025-26.pdf
38 IAEA. Nuclear Safety, Security and Safeguards in UkraineIAEA Report GOV/2022/52. 9 September 2022. https://www.iaea.org/sites/default/files/documents/gov2022-52.pdf
39 IAEA Director General Statement to the United Nations Security Council. IAEA. 30 May 2023

Photo 2. The repair site of Unit 4 ZNPP filled with military equipment, including armored personnel carriers and other large military vehicles. Originally published by the Russian military, March 2024.[40]

40 Reposted in: Militarnyi VideoNews, https://www.youtube.com/watch?v=mTDrzra675A

4.2. Human and Labour Rights Violations at the ZNPP

The staff of each NPP is uniquely trained and cannot be easily replaced. Following the annexation, **ZNPP staff was demanded to receive Russian documents and** to sign contracts with new entities. Reports show that those who refused **faced physical and psychological torture such as keeping people in basements, kidnapping, intimidation, mock execution, digging graves, and torture with electric current.**[41] From 1 February 2024 workers employed by Ukraine's national operator Energoatom were no longer permitted to access the site. At that time the **Russian operating entity employed 4,500 staff at ZNPP, instead of 11,500 staff employed there prior to the armed conflict**.[42]

According to a 2023 brief by the International Labour Organisation (ILO), workers at the ZNPP have been subjected to forced labour and pressured to join unions controlled by the occupying Russian forces. The report also highlighted severe occupational safety and health risks faced by staff.[43]

While most staff-members faced pressure in the first year of the occupation, the risk for the staff remains even 3 years down the line. The follow-up ILO report published in May 2025 states that **13 ZNPP employees had been abducted, including three in 2025**. The whereabouts of at least one detained worker remain unknown.[44]

Truth Hounds' report shows that **physical and psychological abuses are widespread and systematic**, amounting to war crimes and crimes against humanity under international law. Moreover, licensed plant personnel and specialists with essential technical expertise for reactor safety were deliberately targeted, undermining the safe operation of the facility and increasing the risk of a nuclear accident.[45]

There is a need to strengthen international human rights and humanitarian law protections for individuals working at or living near nuclear facilities and advocate for explicit human rights–based safeguards for nuclear infrastructure in UN Security Council resolutions, peacekeeping mandates, and ceasefire agreements.

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41 Truth Hounds, 'In A Nuclear Prison: How Rosatom Turned Europe's Largest Nuclear Power Plant into a Torture Chamber and How Can The World Stop It', September 2023, https://truth-hounds.org/en/cases/in-a-nuclear-prison-how-rosatom-turned-europes-largest-nuclear-power-plant-into-a-torture-chamber-and-how-can-the-world-stop-it/

42 Update 209 – IAEA Director General Statement on Situation in Ukraine. February 2024 https://www.iaea.org/newscenter/pressreleases/update-209-iaea-director-general-statement-on-situation-in-ukraine

43 ILO (2023) Violations of fundamental principles and rights at work at the Zaporizhzhia Nuclear Power Plant and in Enerhodar city in Ukraine, temporarily occupied by the Russian Federation. Geneva: ILO https://www.ilo.org/publications/ilo-brief-violations-fundamental-principles-and-rights-work-zaporizhzhia

44 ILO (2025) Developments in the application of the resolution concerning the Russian Federation's aggression against Ukraine from the perspective of the mandate of the ILO (GB.354/INS/6) [EUROPE-250508-001]. Geneva: ILO. https://www.ilo.org/sites/default/files/2025-05/GB354-INS-6-%5BEUROPE-250508-001%5D-Web-EN.pdf

45 Truth Hounds Report Seizing Power: Rosatom's Complicity in Occupation, Torture, and Nuclear Safety Breaches at the Zaporizhzhia NPP. September 2025. https://truth-hounds.org/en/cases/seizing-power/

4.3. Weak Corporate Responsibility and Accountability Mechanisms

Described violations of labour and human rights go against the Corporate Social Responsibility (CSR) principles that Rosatom publicly upholds. While the company claims commitment to the UN Global Compact, the OECD Guidelines, and the UN Guiding Principles on Business and Human Rights, Truth Hounds reports reveal a starkly different reality at the ZNPP.[46] Rosatom's cooperation with Russian occupation authorities—including its complicity in detaining, coercing, and mistreating plant personnel—demonstrates a blatant disregard for human rights, worker protection, and safety obligations. These actions expose a profound gap between Rosatom's declared CSR commitments and its actual conduct in the occupied nuclear facility.

4.4. Lack of Legislation Safeguarding Nuclear-Related Infrastructure

The importance of supporting infrastructure for nuclear power plants has already been highlighted by the 2011 Fukushima Daiichi disaster, where the loss of external power and cooling systems following a natural disaster led to a reactor meltdown. This case underscored that nuclear safety depends not only on the integrity of the reactors themselves but also on the protection of interconnected infrastructure such as dams, reservoirs, and power grids. Yet, no binding international instruments currently safeguard these systems during armed conflict or emergencies.

Ukraine's national power grid has become increasingly fragile due to **ongoing targeted attacks on critical energy infrastructure since October 2022**. The ZNPP is especially vulnerable, as it relies on ten external power lines to operate safety systems and cool irradiated fuel. When external power is lost, the plant must rely on emergency diesel generators as a last line of defence. As of June 2025, eight complete blackouts have occurred at the ZNPP, each lasting up to three days.[47]

Besides blackouts, the destruction of the Kakhovka Dam in June 2023, **the reservoir that supplied cooling water to the ZNPP significantly increased the risk of a nuclear accident.** The Kakhovka Dam located on the Dnipro River held 18 km^3 of water and its destruction flooded over 600 km^2, cutting off drinking water for 1 million people and forcing the resettlement of more than 100,000 individuals [Photo 3].[48] Cooling the reactors requires substantial water, which is increasingly difficult to secure at ZNPP following the Kakhovka Dam's destruction. Although eleven groundwater wells have been drilled on-site, they do not provide a sustainable long-term

46 Truth Hounds. In A Nuclear Prison: How Rosatom Turned Europe's Largest Nuclear Power Plant into a Torture Chamber and How Can The World Stop It. September 2023 https://truth-hounds.org/wp-content/uploads/2024/01/in-a-nuclear-prison-how-rosatom-turned-europes-largest-nuclear-power-plant-into-a-torture-chamber-and-how-can-the-world-stop-it.pdf

47 IAEA Update 297 – IAEA Director General Statement on Situation in Ukraine. 19 June 2025. https://www.iaea.org/newscenter/pressreleases/update-297-iaea-director-general-statement-on-situation-in-ukraine

48 Truth Hounds. The consequences of the destruction of the Kakhovka Dam – the scale of destruction and the extent of damages. 11 March 2025, https://truth-hounds.org/en/cases/the-consequences-of-the-destruction-of-the-kakhovka-dam-the-scale-of-destruction-and-the-extent-of-damages/

solution, especially if the plant were to return to operational status.[49]

The destruction of the Kakhovka Dam exposed a critical gap in both international and national legislation protecting infrastructure essential to nuclear power plant safety.

Photo 3:
Image of Kakhovka Reservoir and ZNPP with cooling pond June 17, 2023.
Source Planet

Different types of infrastructure requiring protection against military attack that extends beyond the reactor site itself should include: **cooling and water supply** systems such as reservoirs, dams, and pipelines; **power supply and electrical infrastructure**, including substations, grid connections, and backup generators; and **communication and control systems** essential for monitoring and emergency response. Equally important are **transport and access routes** used for maintenance and evacuation; **waste management and storage facilities** that prevent radioactive contamination; s**afety and emergency response infrastructure**—such as firefighting units, medical facilities, and radiation monitoring systems—and **environmental support systems**, including water basins and ecosystems sustaining plant operations, also form part of this critical network.

4.5. Drone Warfare and the Emerging Threats to Nuclear Safety and Security

Drones, or unmanned aerial vehicles, are increasingly used to streamline nuclear power plant (NPP) operations. Russia's full-scale invasion of Ukraine has accelerated the development of combat drones, reshaping global security and raising serious questions about nuclear safety and security. Modern drones include low-cost FPV drones, fibre-optic FPV drones, marine drones, drone swarms, autonomous navigation systems, and AI-assisted targeting. These technologies are inexpensive, hard to detect, and difficult to defend against.

The case of NPPs attacks in Ukraine illustrates the threat: in April 2024, Unit 6 of the ZNPP was struck , in February 2025, a drone with a warhead damaged the protective shelter over Chornobyl NPP's Unit 4, causing fire and structural damage. In April 2025, the IAEA reported that there were three drone attacks on ZNPP, which damaged the roof of ZNPP's training centre. Unfortunately, the IAEA mission was not granted permission by Russian authorities to access the training centre to assess the damage.

Drone strikes can reach far beyond frontlines and serve as low-cost tools for high-value

49 IAEA Update 296 – IAEA Director General Statement on Situation in Ukraine. 12 June 2025, https://www.iaea.org/newscenter/pressreleases/update-296-iaea-director-general-statement-on-situation-in-ukraine

disruption. While NPPs are robust and can withstand some strikes, even minor incidents could trigger reactor shutdowns, mass evacuations, and disruptions to financial markets. At the same time, NPP security forces generally lack the authority and technology to interdict or neutralise drones, leaving critical facilities exposed to emerging aerial threats.

The rise of drone warfare demonstrates that without urgent investment in legal, technological, and operational safeguards, the safety and security of nuclear power plants can no longer be taken for granted.

Photo 4: Chornobyl NPP damaged by the drone attack, February 2025. Source CHNPP[50]

50 ChNPP Infocentre. Photo.
https://chnpp.gov.ua/en/infocenter/photos/category/1271-rosiia-zavdala-udaru-po-novomu-bezpechnomu-konfaimentu

5. Recommendations

Because radiation knows no borders, all states must not only declare nuclear installations, but also implement the highest nuclear safety standards, especially during armed conflict. Immediate action is crucial when these principles are violated.

Nuclear weapons symbolise power and global dominance for some but Africa has deliberately chosen to be a Nuclear-Weapons-Free Zone, focusing on peaceful nuclear technology. Russia's invasion of Ukraine, a country that gave up nuclear weapons and joined the NPT, challenges the notion that NPT signatories are safe from aggression. To stop the ongoing dramatic militarisation of all countries in the world, the AU and African states should be a strong voice in defending any NPT member under military attack.

During the Russian occupation of ZNPP, all seven indispensable nuclear safety principles have been grossly violated. The IAEA and existing international regulations are unable to offer sufficient protection during armed conflict and more should be done to support the efforts of the IAEA.

The AU, with its responsibility to protect its youngest population, must act to prevent another nuclear accident the likes of Chornobyl. The AU should provide a common African position on the safety and security of nuclear installations during military conflict, support the de-occupation of Zaporizhzhia NPP and advocate for the restoration of IAEA-approved nuclear safety measures at the plant.

1. Promote continental nuclear safety legislation:

- Declare and implement **the highest nuclear safety standards**, particularly during armed conflicts. Ensure **iImmediate action** when nuclear safety and security standards are violated.
- **Develop and adopt detailed, legally binding with clear enforcement mechanisms international rules to ensure the protection of nuclear facilities during armed conflict and prevent military occupation.**
- Ensure that legislation includes **protection of critical supporting infrastructure** and covers **attacks on substations and transmission lines** that provide off-site power to NPPs, including:
    - Electrical substations and transmission lines within 100 km of NPPs;
    - Water supply infrastructure (dams, reservoirs, cooling water sources);
    - Transport routes essential for emergency response and fuel delivery.
- Establish clear and enforceable legal frameworks to ensure that nuclear installations **are protected from aerial threats**, including the development of clear definitions and a common understanding of drone usage, the establishment of no-fly zones, mandatory drone registration, and effective penalties for violations.
- Call for a formal mechanism for **referring nuclear safety violations to the UN Security Council**, with specific criteria for escalation.

- Lead the initiative for the international community to develop the binding legislation that prevents military attacks on nuclear facilities.
- Develop a detailed action plan for implementing and enforcing Articles 10 and 11 of the Pelindaba Treaty.
- Address the challenges besides the direct attack on nuclear facilities, such as increased mandate of the IAEA to monitor nuclear safety, upholding human rights and corporate social responsibilities of nuclear corporations.

2. Defend NPT signatories:

- Reaffirm **support for non-proliferation** and publicly condemn attacks on NPT members by nuclear states.
- Condemn the weaponisation of nuclear facilities and the forcible change of ownership of NPPs through military aggression.
- Amplify Africa's voice in defending countries that relinquished nuclear weapons under the Non-Proliferation Treaty, highlighting the risks posed by military aggression, as demonstrated in Ukraine.
- Recognise that attacks on Ukraine's nuclear infrastructure, including systematic targeting of substations serving operating NPPs, further undermines the assumptions that non-nuclear-weapon states receive security benefits from joining the NPT.

3. Adopt a continental position on nuclear safety during armed conflict:

- Declare that **military occupation of operational nuclear facilities** violates the spirit of the Pelindaba Treaty.
- Explicitly recognise that **attacks on electrical substations and transmission infrastructure serving nuclear power plants** constitute threats to nuclear safety equivalent to direct attacks on nuclear installations, and should be condemned with equal force. Because:
    - No nuclear power plant is designed to cope with repeated grid instability;
    - Emergency diesel generators are designed for short-term use, not continuous operation over weeks;
    - Repeated power transients increase stress on reactor equipment and safety systems.
- Task AFCONE to assess the ZNPP occupation and the implications of nuclear facility weaponisation in conflict. In particular,
    - assess **technical risks from repeated loss of off-site power events**, noting that ZNPP has experienced multiple complete blackouts, unprecedented in nuclear industry history;
    - assess **minimum redundancy standards for external power supply** to NPPs during conflict situations;

- develop **corporate responsibility guidelines for nuclear operators doing business in Africa**, incorporating lessons from the ZNPP case which suggest Rosatom awareness of human rights abuses and unethical treatment of personnel at ZNPP [4.2].
- explore options to deploy **early-warning systems for drones and explore counter-drone technologies**, such as radar detection, electronic jamming, or controlled interception systems.
- develop **training** for nuclear operators and authorities **to respond effectively to drone threats**, including interception, reporting, and coordination with national air defence and law enforcement.
- develop guidelines for emergency response plans for drone attacks, including reactor shutdown procedures, evacuation protocols, and communication with local communities and financial markets to mitigate panic and cascading impacts.

4. Support de-occupation and restoration of safety at ZNPP:

- Advocate for the de-occupation of the ZNPP and the reinstatement of IAEA-approved safety measures.
- Call for immediate restoration of all 10 external power lines that served ZNPP prior to the conflict, recognising that the current configuration of only 2 lines creates unacceptable nuclear safety risks.
- Support the establishment of a 30-kilometer demilitarised zone around ZNPP, as proposed by IAEA Director General Grossi.

5. Support IAEA missions and nuclear safety operations:

- Facilitate permanent unrestricted access for IAEA missions inspectors to all areas of the ZNPP, including reactor halls and other areas that are currently restricted by the Russian authorities. Promote the constant access of IAEA to all nuclear facilities, including ZNPP. Demand unimpeded IAEA access to all areas of the plant, including reactor halls and areas currently restricted by Russian authorities.
- Specifically advocate for permanent IAEA monitoring of electrical substations serving NPPs in conflict zones.
- Support establishment of IAEA mission empowered to monitor potential drone threats on the African continent to assess vulnerabilities and coordinate mitigation strategies.
- Negotiate international agreements to establish no-fly zones over nuclear installations in conflict zones.
- Ensure the return of personnel detained at Chornobyl and Zaporizhzhia NPPs who remain in Russia.
- Establish human rights observation missions at ZNPP and other high-risk facilities.

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