

1-2025

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Recommended Citation

Christ, Ashley (2025) "Strengthening Guardrails Against Attacks on Nuclear Facilities," *International Journal of Nuclear Security*. Vol. 9: No. 3, Article 7.

<https://doi.org/10.7290/ijns09372575>

Available at: <https://trace.tennessee.edu/ijns/vol9/iss3/7>

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Strengthening Guardrails Against Attacks on Nuclear Facilities

Ashley Christ

Abstract

Military events at the Zaporizhzhia nuclear power plant in Ukraine have forced the world to confront an unprecedented element of nuclear risk in conventional war fighting. Although this is the first time kinetic military hostilities have threatened the security of an active nuclear power plant, it is unlikely to be the last. At a time when countries in the Middle East are pursuing nuclear power, the international community must urgently build strong norms against military activities that threaten nuclear power plants. This article analyzes existing instruments designed to reduce the risk of attacks on nuclear facilities as well as political practices to that end. It offers recommendations to further strengthen these norms.

Keywords: Nuclear facilities, nuclear security, international humanitarian law, multilateral treaties

1. Introduction

Military events at the Zaporizhzhia nuclear power plant in Ukraine have forced the world to confront an unprecedented element of nuclear risk in conventional war fighting. Although this is the first time kinetic military hostilities have threatened the security of an active nuclear power plant, it is unlikely to be the last. At a time when countries in the Middle East (such as Egypt, United Arab Emirates, and Saudi Arabia)—a region historically fraught with tension—are pursuing nuclear power, it is even more urgent that the international community build strong norms against military activities that threaten nuclear power plants. In this paper, I offer four practical avenues to achieve this goal: (1) establishing regional or bilateral agreements, (2) harmonizing national military documents and practices to comply with relevant international humanitarian law, (3) making political commitments, and (4) ultimately establishing a multilateral, legally

binding agreement. States could pursue these paths in parallel to establish firmly that the international community deems attacks on nuclear facilities unacceptable behavior.

2. Concluding Bilateral or Regional Nonattack Agreements

As the amount of nuclear infrastructure around the world increases, more states will face the risk that fighting within their borders could damage nuclear facilities and release radioactive particles. Indeed, many of the emerging nuclear energy countries—for example, Egypt, Azerbaijan, Ethiopia, Rwanda, and Sudan [1]—have experienced recent episodes of armed conflict. One need only imagine the added suffering of civilians in these countries if recent conflicts had featured an element of radioactive dispersal. We must understand the importance of preempting the risks of “playing with fire,” as the International Atomic Energy Agency (IAEA) director general has described fighting around the Zaporizhzhia nuclear power plant in Ukraine [2].

States considering developing nuclear facilities should take all steps possible to reduce the risk of such events, including by seeking nonattack commitments with neighbors. One avenue for states to pursue these agreements would be in a regional format, such as that taken in establishing weapons of mass destruction-free zones. For example, because many countries on the African continent are considering the benefits of small modular reactors (SMRs) for power, their governments could negotiate a nonattack treaty tailored to address the unique circumstances around SMRs—not only making their countries safer but also making the region more secure for investors.

Alternatively, states could take a bilateral approach to establishing legal protections for their facilities—a model particularly appropriate for those with historical tension with a neighbor. Such countries could look to the example of Pakistan and India’s Non-Nuclear Aggression Agreement, in which each party agrees to refrain from “any action aimed at causing the destruction of, or damage to, any nuclear installation or facility in the other country” [3]. Saudi Arabia and Iran are ripe for such an agreement given the importance each country places on its nuclear infrastructure, the history of cross-border attacks, and the current period of rapprochement. Indeed, in March 2022, an Iran-aligned group struck with drones a Saudi Aramco oil refinery in Riyadh [4], illustrating the precedent for attacking one another’s infrastructure.

Some within the government certainly would oppose this approach, wanting to preserve their right to address with force weaponization activities should such activities take place. However, careful writing of the nonattack agreement could protect this national priority. For example, the agreement could stipulate that it binds parties only if the other is compliant with its comprehensive safeguards agreements with the IAEA. Other legally binding instruments—for example, various Nuclear-Weapon-Free-Zone treaties—contain similar provisions through “reservations” to nuclear weapon states’ signature [5]. To avoid politicizing the IAEA, this should apply only to confirmed weaponization activities and not procedural issues with the agency or unresolved historical questions.

Including this provision not only would alleviate the countries’ concerns about tying their hands if the other races for a bomb, it also would incentivize them to remain within the

Treaty on the Non-Proliferation of Nuclear Weapons (NPT)—the foundation of the global nonproliferation regime. This is a nontrivial issue given Iran's recent hints that it could withdraw from the NPT in response to what it perceived as unfair policies from Western countries. Iran has floated this possibility repeatedly over the last five years, notably in response to US withdrawal from the Joint Comprehensive Plan of Action (JCOPA) [6] and European Union threats to refer JCOPA violations to the United Nations (UN) Security Council [7]. Iranian withdrawal would undermine the Treaty's credibility and deny international inspectors' access to Tehran's enrichment facilities. Added incentives for Iran to stay in the NPT—no matter how small—are good for the international community and international security writ large.

3. Adopting International Humanitarian Law

Much of the international community has already signed onto international humanitarian instruments that prohibit attacks on nuclear facilities. Indeed, Additional Protocol (AP) I of the Geneva Conventions protects “nuclear electrical generating stations” from attacks that could cause the “release of dangerous forces and consequent severe losses among the civilian population” [8]. Although this is a widely accepted international treaty with 174 ratifying states, objections from those with significant nuclear infrastructure—including Pakistan, the United States, Iran, Israel, and Türkiye—limit its efficacy. Pakistan, the United States, and Iran have signed but not ratified the protocol, and Israel and Türkiye have neither signed nor ratified it. In today's tense security environment, these countries' legislative bodies are unlikely to have the political will to ratify AP I of the Geneva Conventions. However, these governments could harmonize their national operational documents with the protocol's provisions, thereby strengthening norms against attacking nuclear facilities even without assuming additional internationally binding obligations.

Some nonsignatory countries have already taken small steps to adopt the protocol in practice even without signature. For example, Iran's government has claimed to be seeking to incorporate the provisions of the protocol into national law, particularly through the creation of the National Committee of Humanitarian Law within the Iranian Red Crescent Society in 1999 [9]. Additionally, Türkiye's Ministry of Defense trains its army's legal advisors and military commanders on international humanitarian law [10]. Türkiye should expand the training to also include AP I of the Geneva Conventions, helping establish norms against attacking nuclear facilities even without undertaking additional legal responsibilities. Other nonsignatory states should explore similar national practices to strengthen respect for and compliance with the four Geneva Conventions.

4. Making Political Commitments

Political fora such as review conferences of the NPT, the General Conference of the IAEA, and the UN First Committee on Disarmament and Security serve as important platforms for states to build norms of behavior related to nuclear conduct. Through resolutions and final documents, states seek to secure international buy-in to their vision of the path to security. Although many states, particularly those from the Non-Aligned

Movement (NAM),¹ prefer legally binding instruments, political commitments can be equally effective in deterring the undesired behavior [11]. The political approach may be preferable when the subject is dynamic, unverifiable, urgent (i.e., the time frame required to negotiate a legally binding instrument is untenable), or the political atmosphere precludes a legally binding agreement. States should proactively seek political support in security-related fora for the idea that attack of a peaceful nuclear facility would violate an accepted norm.

The IAEA's "Seven Pillars of Nuclear Safety and Security" offers a practical framework for articulating in these settings norms against attacks on peaceful nuclear facilities [12]. The IAEA has socialized these principles among member states, and the groundwork has been laid through their inclusion in the 2023 IAEA General Conference (GC) nuclear security resolution and Director General Grossi's calls for a demilitarized zone around the Zaporizhzhia nuclear power plant. A possible next step to further establish the seven pillars as an accepted norm would be for a state to sponsor a relevant resolution in the UN First Committee. Broad support would likely exist for such a resolution, as indicated by the consensus support for this language in the 2023 GC nuclear security resolution. By securing a large number of cosponsors and signatories, the UN General Assembly would send a strong signal that attacking nuclear facilities is unacceptable. This path would follow the model set by a 2022 UN First Committee resolution calling on states not to carry out direct-ascent antisatellite (ASAT) missile testing. The resolution aimed to garner international agreement on what constituted unacceptable behavior surrounding ASAT tests [13]. In other words, the resolution helped form and enumerate what states saw as acceptable and unacceptable behavior in this space. Using this model could help secure international agreement on the parameters of unacceptable behavior for fighting near nuclear facilities, capturing synergy from the work the IAEA has invested in the seven pillars concept.

5. Concluding an Internationally Binding Agreement

In the past, the international community has pursued a legally binding instrument to prohibit attacks on nuclear facilities—namely, under a convention on radiological weapons. Unlike other unfulfilled negotiations, many of which stall because of fundamental disagreements between the negotiating parties, negotiations on a radiological weapons convention seem to have instead petered because of competing priorities. Therefore, unturned stones could unlock a path forward.

The Conference on Disarmament (CD) vigorously pursued a radiological weapons convention from the late 1980s to the early 1990s, creating a subsidiary body during each session from 1985 to 1992 "with a view to reaching agreement on a convention prohibiting the development, production, stockpiling, and use of radiological weapons" [14]. Throughout this period, states disagreed on the appropriate scope of such a convention—namely, whether it should include attacks on nuclear facilities. The relevant subsidiary body even comprised a group dedicated uniquely to addressing this issue.

¹ The NAM has consistently messaged in multilateral fora that attempts to address security concerns without a legal instrument are insufficient—for example, in discussions about lethal autonomous weapons and arms issues in outer space.

The subsidiary body in 1992 proposed a draft treaty upon which the wider CD was to build and negotiate. The draft treaty offered options for addressing the thorny issue of attacks against nuclear facilities, proposing three different formulations of varying severity: (1) never to attack a nuclear facility covered by the treaty, (2) never to attack or threaten to attack any nuclear facility, or (3) never to release and disseminate radiological substances by attacking nuclear facilities covered by the treaty [15]. States had overcome significant obstacles to reach such a point, so what stymied the momentum?

Reports from the CD to the UN General Assembly during these years indicate changes over three periods. The reports from 1986 to 1992 called for the CD to establish a subsidiary body on radiological weapons and culminated in 1992 with proposed language to include in a treaty. Reports from 1993 to 1998 noted that the CD decided not to establish a subsidiary body and referenced the 1992 report as the basis of the CD's work on the topic. From 1997 to 2002, the CD did not create any reports on the relevant agenda item. Such reports began again only in 2002 after a CD president proposed to revisit the issue "in light of new threats [demonstrated by September 11th]" and initiated informal consultations on the topic [16]. Examination of these discussions reveal that efforts to address radiological weapons in the CD had shifted to address situations in which terrorists could use the materials to create a dirty bomb. Indeed, the guiding document of the informal discussions said that future work on a radiological convention should not build upon the past discussions in the CD but should instead proceed from the "acute awareness of the risk that a dirty bomb could be used by non-State actors" [17].

In 2014, Australia proposed the CD again pursue radiological weapons conventions, banning states from using radiological weapons, but the proposal failed to gain consensus. Just as the events of September 11, 2001 moved the international community to address the risk of non-state use of radiological sources (for example, through the 2004 revision of the IAEA Code of Conduct and the 2005 adoption of the International Convention for the Suppression of Acts of Nuclear Terrorism to address dirty bombs), the threat of damage to the Zaphorizyha nuclear power plant during war time should refocus the international community on drafting a radiological convention that includes state attacks on facilities.

6. Conclusion

The nuclear security crisis at the Zaphorizyha nuclear power plant and the deployment of nuclear facilities in historically fraught regions heightens the need for normative and legal guardrails against interstate attack on nuclear facilities. Bilateral agreements and political frameworks can effectively shape shared expectations about appropriate behavior around nuclear infrastructure in wartime. Furthermore, they can set the groundwork for multilateral legal agreements in the future [18]. States should make clear that interstate attacks on nuclear facilities are fundamentally unacceptable by concluding regional or bilateral nonattack agreements, harmonizing national practices with international humanitarian law, promoting the IAEA's framework for nuclear security through political commitments, and negotiating a radiological weapons convention. The

result? A safer, more secure world for both civilians and combatants during times of conflict.

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Ashley Christ earned a master's degree from Johns Hopkins School of Advanced International Studies. She has worked for the US Congress, US National Nuclear Security Administration, and US Mission to the Conference on Disarmament. Ashley is currently a Foreign Affairs Officer in the US Department of State. The views expressed are her own, not necessarily those of the US Government.