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Nuclear Security and Armed Conflict

Ali Alkis
Black Sea Women in Nuclear (BSWN)

Introduction

The evolution of nuclear security has broadened its focus from solely **state-sponsored espionage** to encompass a range of threat actors, including **criminal organizations and terrorist groups**. The terrorist attacks of **9/11**, underscored the potential for non-state actors to utilize nuclear or radiological materials in future attacks. This led to the international nuclear security regime, which primarily targets **non-state actors** due to their historical role as the primary threat to nuclear materials and facilities. However, this exclusive focus on non-state actors limits the regime's effectiveness **against threats posed by state actors**, highlighting the need for a more comprehensive approach to nuclear security.

Nuclear Security under Challenge

Nuclear security encompasses protecting nuclear materials, facilities, and associated activities from **unauthorized and malicious actions**, which can stem from both state and non-state actors. In armed conflict scenarios, the threat posed by state actors, as exemplified by the Russian occupation of Ukrainian nuclear power plants, highlights the need to address **beyond design basis threat situations**. The potential consequences of armed attacks on nuclear facilities extend beyond the conflict parties, with **radiation leaks** posing significant transboundary risks to human health and the environment.

International cooperation is essential to mitigate these risks, yet existing instruments like the Geneva Conventions' Additional Protocol I and decisions by the International Atomic Energy Agency (IAEA) face challenges in implementation due to:

- legal ambiguity,
- inadequacy, and
- lack of enforcement mechanisms.

There's a clear necessity for international assurance mechanisms to prevent and protect against armed hostilities near nuclear facilities, particularly given the lessons learned from recent conflicts and the potential expansion of nuclear energy to new states, including with novel modular reactors.

Introducing new rules and norms for protecting nuclear facilities may not necessarily result in direct enforcement, but it would prevent states from seeking to legitimize acts of aggression against such facilities and exploiting current policy gaps.

Solutions

1 - Recommendations at the legal level

Establish an international agreement This agreement would encompass various facilities and activities, including nuclear power plants, research reactors, enrichment facilities, and waste management. Such an agreement would impose legally binding obligations on states, leaving no room for misinterpretation and effectively preventing future aggression.

Given the potential challenges in negotiating a comprehensive global agreement, **regional agreements** could serve as steppingstones, setting precedents for broader international agreements.

Additionally, **bilateral agreements** between neighboring states can serve as confidence-building measures, fostering cooperation and reinforcing political will for broader agreements.

These legal mechanisms aim to enhance protection against armed attacks on nuclear facilities and promote international cooperation in nuclear security.

2 - Recommendations at the institutional level

A practical recommendation is to empower the IAEA through a new **nuclear security and safety protocol** with member states. This protocol would grant the IAEA authority to conduct missions to nuclear facilities even during armed conflicts, enabling technical assistance under military protection without hindrance from member states' sovereign rights.Such a protocol would align with the IAEA's objectives and ensure accurate information flow from facilities, crucial for timely emergency responses. Additionally, it could include provisions for compensation if parties to a conflict disrupt or damage nuclear facilities.

3- Recommendations at the operational level

Operational recommendation serves as interim measure to address shortcomings in legal and institutional frameworks for nuclear security during armed conflicts, which may take time to resolve due to political differences. One such recommendation is to establish a **nuclear safety and security protection zone** around nuclear facilities to mitigate risks during conflicts, reinforcing the objectives of the IAEA until a political solution is reached. While operational recommendation does not prevent attacks against nuclear facilities, it manages wartime threats during nuclear security emergencies, complementing legal and institutional measures. It offers **practical solution** until broader legal and institutional frameworks are implemented.

Conclusion

As a cost-effective, low-carbon and reliable energy source, nuclear energy is crucial component in achieving global **net-zero goals**. However, the expected expansion of nuclear facilities to new states, some possibly in conflict-prone regions, underscores the need for enhanced protection against wartime threats. The potential radiological consequences of attacks on nuclear facilities necessitate global recognition of these challenges. The ongoing nuclear security crisis in Ukraine serves as a stark reminder of the importance of proactive measures to safeguard nuclear facilities. The policy recommendations may appear **politically challenging or even unrealistic today**, but the grave potential radiological consequences of armed attacks against nuclear facilities mean that they must be kept **safe and secure, including during military conflict**.