Radiation Protection in Military Conflicts: Lessons from Ukraine

Katarzyna Siegien PhD, Senior Adviser

NERIS Workshop 2024 Monday 11th November 2024, Rome, Italy Aurelia Congress Center, VEGA Room

DSA

Direktoratet for strålevern og atomsikkerhet

Norwegian Radiation and Nuclear Safety Authority

DSA-NEA Workshop on RP during armed conflict, Nov 2023, Oslo, Norway

→ A Workshop co-organised by the Norwegian Radiation and Nuclear Safety Authority (DSA) and the Nuclear Energy Agency, in cooperation with the Ukrainian Nuclear Safety Authority (SNRIU).

→ 130 experts from 28 countries, NGOs and international bodies (NEA, European Union, HERCA, IAEA, ILO, WANO, and WHO) explored how, during armed conflict:

(1) to maintain and enhance the capability and capacity to monitor, analyse and manage radiological protection and public health;

(2) to anticipate consequences on the implementation of radiological protection regulation and practices.



The workshop is comprehensively documented in an NEA/DSA joint publication

RP during war in Ukraine

- → Adverse Impact on Nuclear Facilities:
  - → Occupations, bombings, and theft of radioactive sources
  - → Disruptive events impacting day-to-day operations, transportation, and waste management
- → Challenging Circumstances:
  - → A lack of equipment and human resources
  - → Workers, families, and the entire population experience significant stress
  - → Healthcare system undermined
- → Insights from Ukraine:
  - → Improved understanding of the reality on the ground during armed conflicts.
  - → Enhanced resilience within RP and nuclear safety frameworks.
- → Main challenges for regulatory body:
  - → Communication Breakdowns
  - → Direct Attacks, Infrastructure Damage
  - → Information Delays and Errors
  - → Restricted Access to Facilities, Physical Barriers, Logistical Challenges
  - → Targeting of Regulatory Infrastructure
  - → Cyber Threats





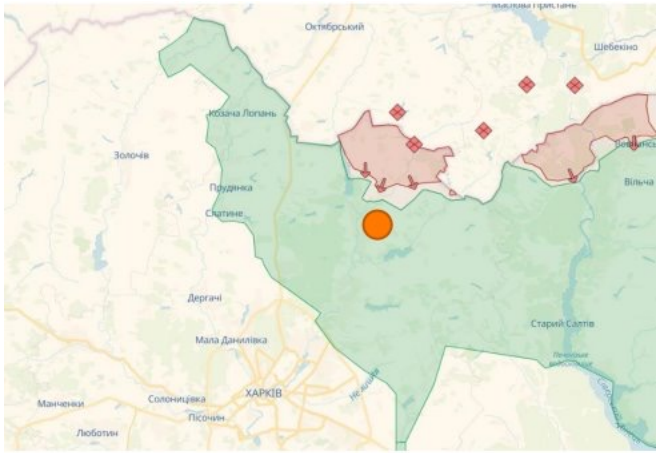
Before and after destruction of Khakovka dam

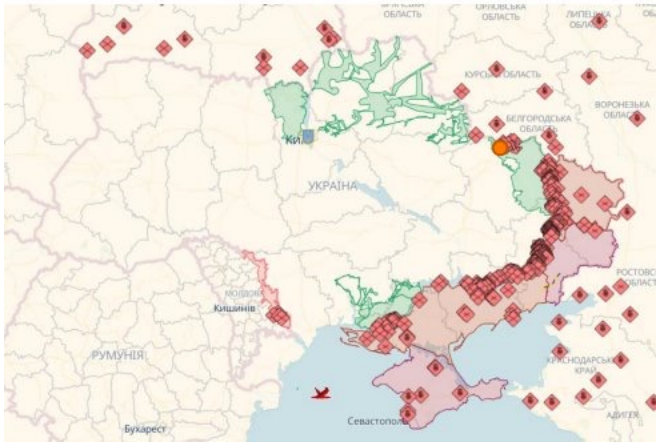


220 mm Uragan rocket on the ZNPP building

RP during war in neighbouring countries

- → War weakens nuclear and radiological safety in various ways
- → How to be better prepared for similar situations and address hostile actions.
- → No country has fully developed specific regulatory and operational provisions for nuclear safety and RP for their civilian nuclear facilities in case of war.
  - → Some countries have started implementing frameworks to address challenges.
  - → Routine operations at nuclear facilities and emergency plans may need to be adapted considering the potential of armed conflict.





Key take-aways

- → Importance of the system's adaptability:
  - → To make regulatory frameworks more flexible and capable of rapidly implementing new operational RP plans and procedures during armed conflict
  - → Useful to update national regulatory assessments for emerging threats
- → **Essential to foster international collaboration and knowledge sharing,** including learning from each other's experiences and best practices and integrating them into national frameworks.
- → The conflict underscores the critical role of international assistance and collaboration in maintaining nuclear safety.
- → This international aid is not only crucial for immediate safety needs but also for rebuilding and strengthening the regulatory infrastructure post-conflict.

NEA
NUCLEAR ENERGY AGENCY

IAEA
International Atomic Energy Agency

Actionable recommendations

Area 1- Strengthen international cooperation and reinforce international conventions



- → Strengthen international/bilateral cooperation to address radiation and nuclear challenges within Ukraine.
- → Establish such cooperation to enhance preparedness and response in friendly neighbouring countries.
- → Consider an international/multilateral framework to coordinate activities on the provision of assistance (expertise, human and financial resources), on procurement of specialised equipment and other matters (including post-conflict recovery).



- → Establish a small task force or team of representatives from key organisations (development of effective networks).
- → This task force would reflect on the learning and actions which could then be considered for implementation at an international level.



- → Review and enhance conventions (and/or guidance on their application) to explicitly exclude nuclear installations from being targeted in attacks (e.g. by granting nuclear facilities special status beyond normal infrastructure during armed conflict, establishing exclusion zones around facilities) – although ruled out by aggressors, it could provide a basis for holding them accountable post-conflict. Cooperation protocols could then be scaled toward developing global decisions on how to act together to address nuclear facility risks into the future, essential in achieving a collective commitment for global security.

Actionable recommendations

Area 2- Build and maintain resilience nationally and beyond through flexible regulatory frameworks



- → Build on information sharing mechanisms:
  - → to strengthen networks among regulators for different sectors and develop national resilience when facing radiation threats combined with other threats;
  - → to establish protocols for mutual cooperation among all organisations that are able to support swift mobilisation of (human and logistics) resources during armed conflict;
  - → to support an holistic dialogue: between different regulatory bodies in various areas of responsibility and safety issues, but also health and welfare services; and with the military on how risks near major facilities can best be managed.



- → Build more flexibility into regulatory frameworks to allow for adaptive decision-making and prioritisation rather than trying to change regulations in urgent situations
- → A vigorous safety culture within and among the operators, TSOs, regulators and other organisations well in advance of armed conflict is key to support safe operations during times of limited and/or intermittent regulatory inspections and oversight, information accessibility challenges, human capacity deficiencies, etc.



- → Integrate radiological protection within the overall resilience system. Relevant international organisations, including the NEA, are encouraged to prepare guidance for regulators.

Actionable recommendations

Area 3- Develop practical guidance for RP while the RP principles and policy framework apply



→ Better understand what application of RP principles means in practice and how to improve the practicability of RP to ensure an appropriate level of protection.



→ Revisit the justification process to recognise additional threats during armed conflict (e.g. missiles, mines) that could require prioritisation to be made on a case-specific basis.

→ Adapt regulatory frameworks to make decisions considering other risks, while adhering to the principles in place (justification and optimisation) which guide the application of the international RP system when deciding protective actions.



→ Consider war scenarios within the ICRP system, as a country at war has not yet been considered. A war scenario could have important implications for the application of the concept of justification and selection of reference levels.



→ Address the challenge of a cascade of crises occurring simultaneously during armed conflict, making optimisation very difficult and complex.

Actionable recommendations

Area 4- Adopt an All-hazards approach, broaden dialogue between civil and military authorities for EPR



→ Engage in dialogue with authorities responsible for safety in other fields, including military authorities, in addition to RP and nuclear safety communities.

→ Establish communication networks for the decision process to gain insights on how to operate within the objectives of military actions. Sharing the experience of different countries could be an important first step.



→ Adopt a holistic view so that the focus is not solely on RP, but also security and other threats, i.e. all-hazards approach. This includes threats associated with the availability of reliable information, how to make decisions in the absence of data, establishing reliable and direct contact points for trustworthy exchange of information, ensuring security of communication channels.



→ Enhance EPR analysis with release scenarios including war scenarios for nuclear installations but also for high-risk radiation installations (e.g. waste storage facilities, industrial irradiators, hospitals).

→ Consider building defense and mitigation capacities and capabilities. A first step for countries could be sharing of scenarios already available within national EPR programmes.



→ Adjust protective actions during armed conflict and disruptive scenarios.

→ Strive for balance between different hazards and risks (e.g. advice to shelter from shelling may conflict with advice to evacuate due to radiation emergency).

Actionable recommendations

Area 5- Stakeholder engagement, critical aspects of information, communication and trust



- → Practice communication of information to those who need it, especially during emergency situations when electricity supplies and communication channels may be disrupted.
- → Conduct exercises to improve coordination and develop most effective communication channels



- → Leverage social scientists to address issues related to reliability, misinformation, and fake news during conflict situations. Their expertise can facilitate effective communication in emergencies.



- → Engage civil society actively to build trust. Proactively implement trust-building initiatives well before conflict situations arise between operators, regulators, other stakeholders and the public in general

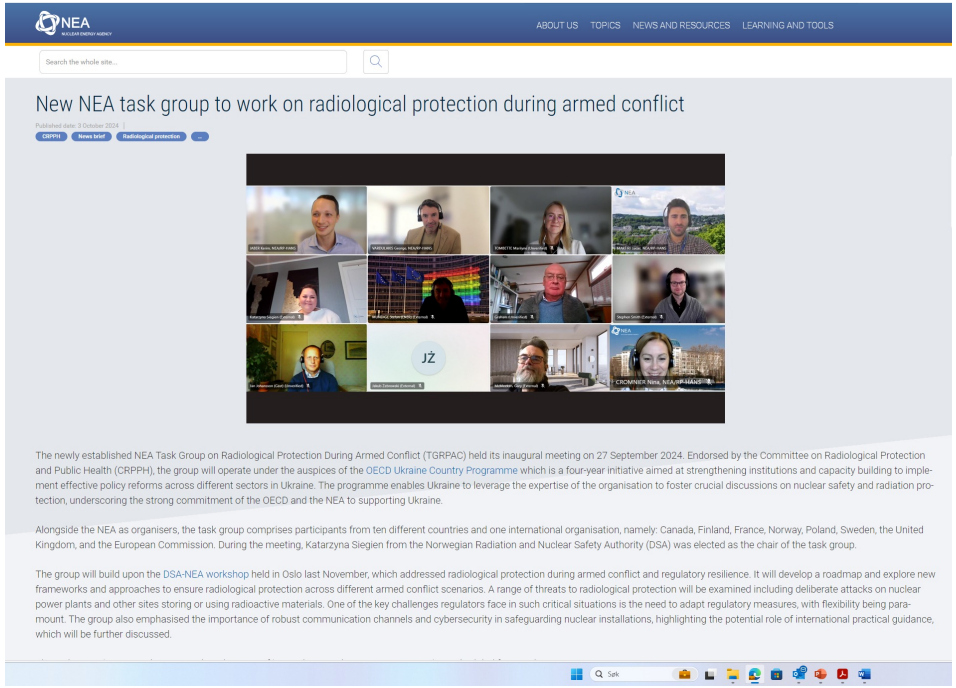
List of potential activities- CRPPH/WPNEP

- → Organise exchanges/forum where situational awareness is shared between countries and inside countries (including populations):
  - → close and continuing **dialogue with all stakeholders** concerned (possibly including interactions between civilian and military) at local, national, international levels; strengthen cooperation/collaboration for better coordination
  - → Promote citizen participation and stakeholder involvement in armed conflict situation including involvement of NGOs, civil societies in assessment and management of the radiological situation; Public and media interactions with national authorities including the regulators
- → Develop methodologies and strategies for regular review of regulatory assessment
  - → The review may address roles, functions, responsibilities defined in regulation. It could be informed by gaps analysis and impact/risk assessment of a wider spectrum of threats to enhance preparedness, response capabilities and organisational/operational resilience (ie mitigate risks/impacts from those threats) (this topic could be investigated with other NEA Standing committees notably CNRA and CSNI)
- → Investigate how to introduce **flexibility in the operational application of the current regulation** to better cope with the specific situation of armed conflict (this topic could be investigated with other NEA Standing committees notably CNRA and CSNI).
  - → Among the topics to address are: e.g. the selection of appropriate radiological Reference Levels, the management of inspection and licensing process; environmental data sharing and secured channel for information access, and secure communication procedures

NEA Task Group on Radiological Protection During Armed Conflict

Key (draft) Objectives for the Comprehensive Risk Assessment

- → Development of Recommendations for Adaptable Regulatory Frameworks
- → Integration of Physical and Cybersecurity into Radiological Protection
- → Enhancement of Radiological Monitoring and Public Health Protocols
- → Strengthening International Collaboration and Legal Compliance
- → Protection of Information and Cybersecurity.
- → Public communication



Future Directions

Based on the experiences in Ukraine, several key recommendations emerge for the international community:

- → **Strengthening International Laws**: There is a need to enhance international laws and conventions to protect nuclear facilities during conflicts explicitly.
- → **Building Resilience**: Developing more resilient regulatory frameworks that can adapt to the disruptions caused by armed conflict is crucial.
- → **Fostering International Cooperation**: Enhanced international cooperation is necessary to ensure that countries can quickly mobilize support and share best practices in nuclear safety and radiological protection.
- → **Incorporating Adaptability in Regulatory Practices**: Regulatory practices must be flexible enough to respond to the dynamic challenges posed by military conflicts, including the potential for rapid escalation and widespread impact.

Conclusions

- → Importance of Radiation Protection:
  - → Ensuring effective radiation protection measures to safeguard public health and the environment.
  - → Proactive steps to address radiation protection, including training and support to local regulatory bodies.
- → International Collaboration:
  - → Vital role of international organizations in supporting Ukraine’s nuclear safety.
  - → Strengthening global nuclear safety frameworks through collaboration.
  - → No practical international guidance found on managing and regulating radiological protection (RP) and nuclear safety during armed conflict.
  - → Potential collaboration through organizations like NEA-OECD TGRPAC.

Thank you.

Katarzyna.siegien@dsa.no