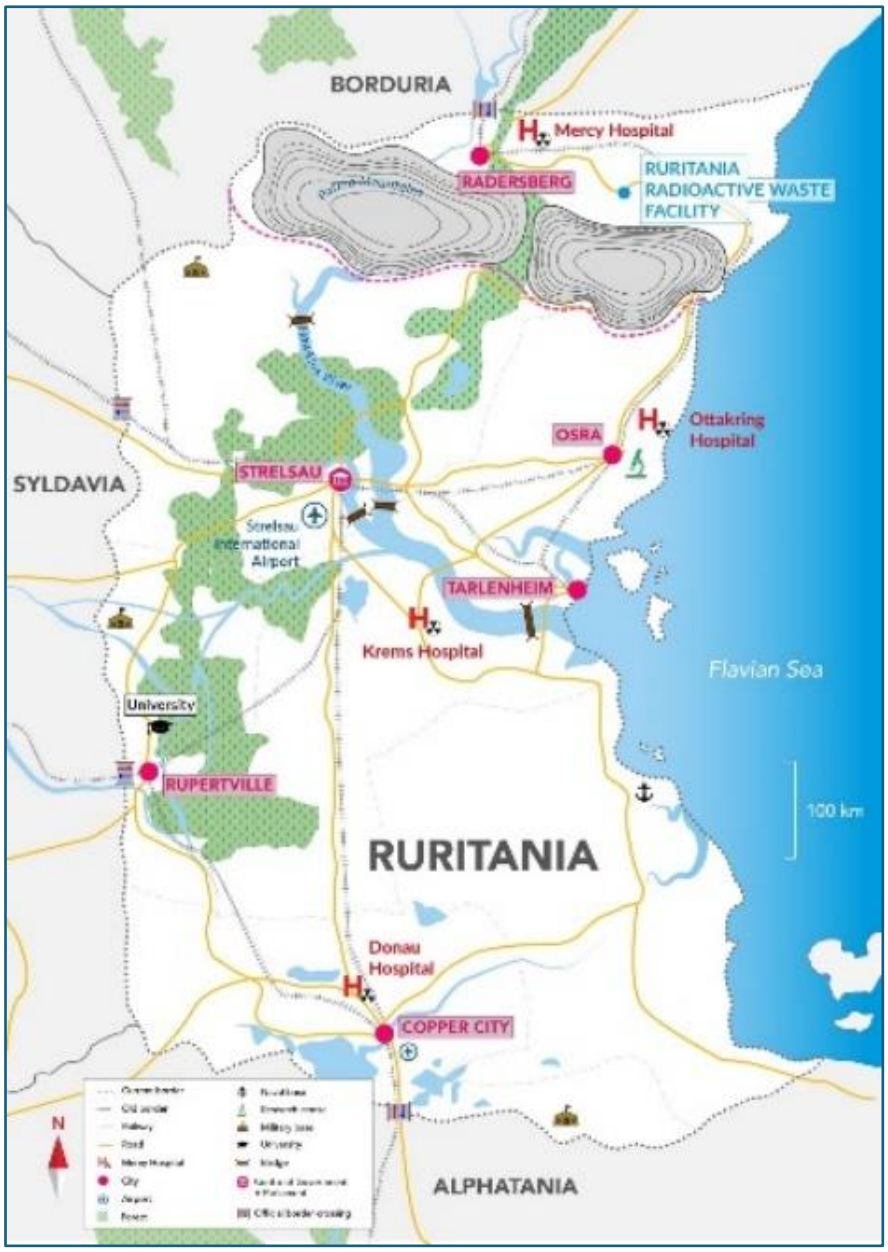
Joint Exercise on Resilient Radioactive Source Security During Wartime and Violent Civil Unrest (Active Conflict)

5–7 May 2025

REPORT



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Background

Until the 1950s, only radionuclides of natural origin, such as Radium-226 – an isotope of radium used to treat some types of cancers – were available for use. Today, radionuclides artificially produced in nuclear facilities and accelerators, including Caesium-137, Colbalt-60, and Iridium-192, are used globally for medical, industrial, agricultural, research and educational purposes.The International Catalogue of Sealed Radioactive Sources and Devices (ICSRS) contains information on upwards of 5,000 different types of radioactive sources, 4,000 radioactive devices and over 1,000 manufacturers or suppliers[1]

The number of state-based conflicts currently recorded number 55 with eight of these classified as wars.[2] Despite these situations, the communities where these conflicts are occurring are also utilising or have utilised radioactive sources.

Measures taken by states to ensure the safety and security of radioactive sources in peacetime are not designed for active conflict. These circumstances will stretch the capacities of the State to provide appropriate legal, regulatory, compliance and inspection systems in relation to radioactive sources. An active conflict affects the ability of a licensee/operator to maintain the safety and security of its radioactive sources if the area in which the sources are held, or through which they may need to be transported, are affected by conflict. It also will fundamentally change the considerations that impact the planning of and preparedness for response to a nuclear security incident involving radioactive sources and the considerations for the protection and security of radioactive sources, in possession, use and transport.

A significant escalation in conflict in many regions of the world in recent years has created a demand from the professional community and competent state authorities to understand what is required to develop measures to prepare for and respond to events that are beyond the design of current security measures. War and violent civil unrest affect all spheres of life of a country and will most likely reveal a lack of preparation to respond to different types of nuclear security incidents that may arise in this context, including failure to establish effective and appropriate systems for communication at the organizational, local, regional, and state levels.

Accordingly, this is an appropriate time to consolidate various experiences and offer the radioactive source security community an opportunity to discuss lessons learned from countries who have endured or are enduring active conflicts and how to better prepare for such situations.

This event was funded by the United States Department of Energy, National Nuclear Security Administration, Global Material Security, Office of Radiological Security under Award Number: DE-NA0004059 and held from 5-7 May 2-25 at the InterContinental Hotel in Vienna, Austria.

[1] https://www.iaea.org/resources/databases/international-catalogue-of-sealed-radioactive-sources-and-devices

[2] Obermeier, Anna Marie; Håvard Strand & Georgina Berry (2023) Trends in State-Based Armed Conflict, 1946–2022, *Conflict Trends*, 1. Oslo: PRIO. https://www.prio.org/publications/13588

Scope and Objectives

This event, Joint Exercise on Resilient Radioactive Source Security During Wartime and Violent Civil Unrest (Active Conflict), is a continuation of a series of WINS activities related to the topic. Previously WINS held events in October 2022 (in person) and March 2023 (online). These discussions resulted in the publication of a WINS Special Report, "Securing Radioactive Sources during War and Violent Civil Unrest" (July 2023)[3].

WINS plans to update the 2023 Special Report to take account of new information and analysis based on, inter alia, the results of this Joint Exercise.

The objective of the Joint Exercise was to consider, through scenario-based discussion and expert presentations, how to promote resilience in radioactive source security arrangements during active conflict in the context of the following issues:

- Increasing Global Conflict: Is it time for a Paradigm Shift?
- How does radioactive source security during active conflict (extraordinary times) differ from peace time (ordinary times)?
- Is the current framework of international instruments, national laws, and guidance sufficient for extraordinary times?
- How can resilience in radioactive source security during active conflict be achieved?

Introduction of Participants

The event was attended by 24 participants who came from regulatory and law enforcement agencies, and operating organisations from Burkina Faso, Cambodia, Colombia, Colombia, DRC, Georgia, Iraq, Jordan, Libya, Lithuania, Mexico, Nigeria, Philippines, Romania, Serbia, Taiwan, Ukraine, USA and IAEA. The event was moderated by Mr David Duhamel and Dr Stacy Mui and supported by Mr Chris Behan.WINS team: Rhonda Evans, Nataliia Klos, Luka Cekic, and Michal Goldrei.

Event Process

A discussion-based scenario was used as the structure for the event, focusing participants' attention on what needs to be done to improve resilience of radioactive sources security arrangements and how to prepare for and respond to nuclear security incidents involving radioactive sources during war and violent civil unrest, with a view to risk reduction. During the three-day Joint Exercise, participants focused on scenarios with low, medium, and high intensity events. Participants were able to share their experiences, drawing from both their professional roles and regional perspectives.

[3] https://www.wins.org/document/securing-radioactive-sources-during-war-time-and-violent-civil-unrest/

DAY 1

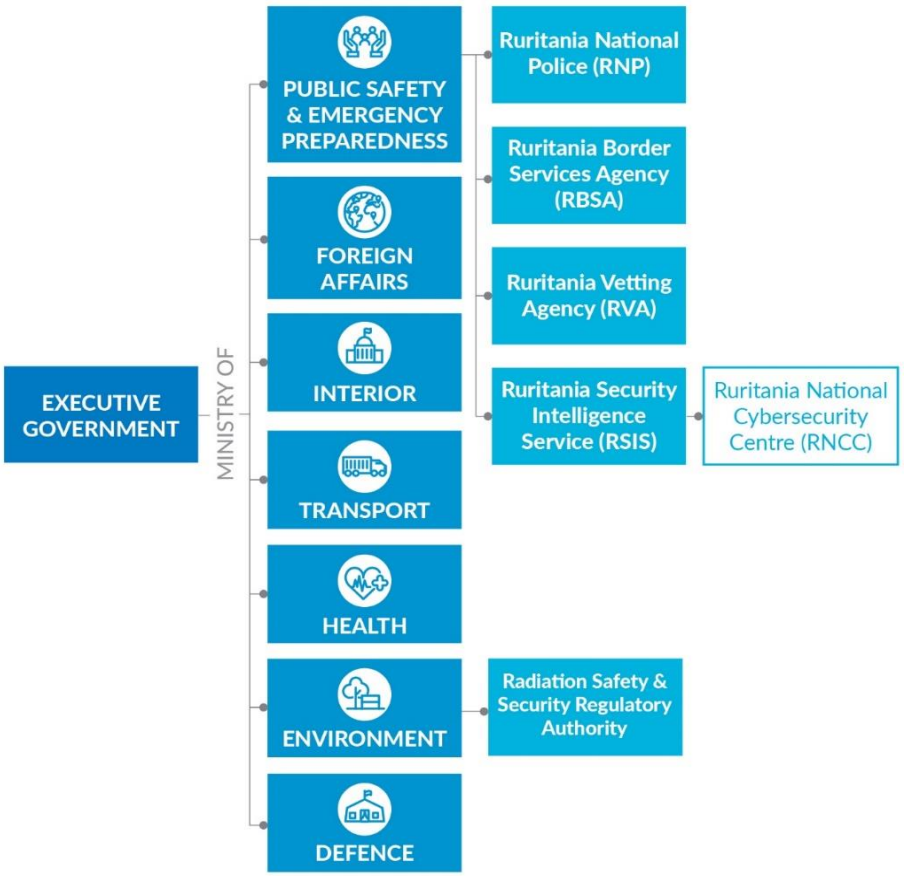
Introductory slides

Increasing Global Conflict: Is it time for a Paradigm Shift?

- How is radioactive source security during active conflict (extraordinary times) different from peace time (ordinary times)?
- Is the current international framework, national laws, guidance, and instructions sufficient for extraordinary times?
- How can resilience in radioactive source security during active conflict be achieved?

These questions framed the discussion throughout the Joint Exercise.

Participants were also encouraged to think about their existing national infrastructure for nuclear security and the extent to which it can be adapted from peace time for active conflict. Below is the fictional structure we used to describe the typical national infrastructure for nuclear security.



Ukraine's experience in ensuring the security of radioactive materials

Impact of Martial Law

A **representative of the Security Service of Ukraine (SSU)** gave a presentation which described the legislative framework that supports the roles and responsibilities of the SSU in peacetime and under martial law. He described the responsibility of the SSU to, inter alia, ensure the secure transportation of radioactive sources out of the combat zone.

To illustrate the difficulties encountered due to the changing responsibilities under martial law, he shared unclassified information regarding the transportation of radioactive sources from the premises of a licensee in Eastern Ukraine, next to the combat zone, to a safer place. The main goal was to ensure that the regulatory body approved the movement of the sources. The other challenge was to find an organisation that would undertake the transport of the radioactive sources in these circumstances.

An issue that arose in this scenario was who should bear the financial cost of moving sources out of the conflict zone to a safe place. It was agreed that this needs to be solved by each individual state.

Licensee challenges during Active Conflict

A **representative of the SSE "Radon Association" Mr Olexandr Dudar** gave a presentation on the challenges faced by Radon, a radioactive waste management facility, during active conflict.

He noted that securing radioactive sources can be difficult even in peacetime. But active conflict introduces a whole new dimension of complexity and danger. The context is no longer that of routine security concerns. The risks increase based on deliberate, malicious attempts by state actors to steal or weaponize these materials.

He also noted the unintended consequences of hostilities, including collateral damage from bombs or missiles that can destroy storage facilities or cut off power to security systems.

Conflict situations can lead to a breakdown in normal regulatory oversight and severely disrupt the logistics needed for response. Therefore, maintaining security under these conditions demands more than just standard protocols; in his view it requires resilient systems and a high level of coordinated action among stakeholders.

He also shared his observation that regulations that have been written to apply to peacetime emergencies or response to incidents of illicit trafficking of radioactive material could form the basis for preparedness and response to the circumstances created by active conflict. These frameworks provide a logical sequence of actions that may be adapted to a high-threat, high risk environment.

He noted that coordination is paramount. In a crisis, especially one unfolding during an active conflict, no single entity – whether the operator, regulator, or a law enforcement agency – has the resources, authority, or information needed to manage the situation effectively. His conclusion is that effective response relies upon a network of stakeholders working together. Effective response doesn't happen spontaneously; it stems from thorough preparedness.

He noted that regulations often differentiate between two types of adverse situations, and this distinction is useful even in conflict.

- **Emergency situations** typically arise from external events – natural disasters, or perhaps technogenic failures like a fire caused by shelling or a loss of power.
- **Crisis situations**, on the other hand, stem from deliberate, unlawful acts – theft, sabotage, a direct attack, or an insider threat.

Recognizing this difference helps tailor preparedness. Being prepared means having pre-defined action plans, identifying potential triggering events relevant to conflict – like loss of communication, physical breaches, or nearby military activity. It means ensuring personnel are not just trained, but ready and equipped to act decisively under extreme stress, knowing their roles and responsibilities. Preparedness plans only work if the people involved understand and can execute their roles during an emergency or a crisis and have been trained beforehand on what will be required of them. Training and preparation also make it more likely that trained responders will continue to perform under pressure.

His conclusion is that all these elements – coordination, response frameworks, preparedness, defined roles – contribute to building resilience. Resilience is the ability of the security system – including the technology, procedures, and people – to anticipate threats, withstand challenges, adapt to changing circumstances, and recover functionality. Resilience involves multiple layers: Robust physical security designed for high threats, redundancy in critical systems like power and communication, clear, practiced procedures, well-trained personnel, strong internal and external communication links, protecting sensitive information, having pre-planned compensatory measures for when things fail, and – crucially – regular drills and exercises to test everything.

Information is also crucial for effective response during a crisis. Timely and accurate information is critical, yet it's often one of the first things compromised during conflict. A resilient system needs robust mechanisms for **internal alerts** when something goes wrong, and clear, established protocols for **reporting incidents externally** – to regulators, law enforcement, emergency management, and potentially international bodies like the IAEA. Just as important are ways to ensure information flows *between* these responding agencies. Conflict makes this incredibly hard. Communication lines might be down, information might be unreliable, and there is significant security risks associated with transmitting sensitive data. Planning for these communication challenges is a vital part of preparedness.

He gave an overview of the functioning of RWSF from the date of the full-scale war 24.02.2022:

Warfare on the territory of the location of Radioactive Waste Storage Point	– NO
Capture of territory of the Radioactive Waste Storage Point	– NO
Losing control over Radioactive Waste	– NO
Damaging of Storages of Radioactive Waste	– NO
Suspension of License and License activity	– NO
Continued operation of Radioactive Waste Storage Facilities	– YES
Realization of regulatory radioactive monitoring	– YES
Functioning of physical protection systems	– YES

Scenario Based Joint Exercise and Discussion

Participants in the joint exercise were presented with a scenario based on escalating tensions in the fictional region of Octavia between the countries of Borduria and Ruritania. Instability in the region has been created by economic disparity and ethnic tensions.

The main events during the joint exercise took place in Ruritania with varying degrees of intensity. This exercise serves as a demonstration of the evolving threat and risk environment as a region transitions from peace time to escalating levels of active conflict.

The Patma Mountains region in Ruritania, a territory with strategic significance that was once part of Borduria, is a point of contention. This region is economically depressed, due to its remoteness from the capital city of Ruritania. It provides a focus for the supporters of a separatist group the Zendan People's Army (ZPA). One contentious issue that can be exploited to cause tension among the population is the potential risk associated with the Regional Radioactive Waste Facility. Another source if regional instability is the smuggling by the EKC Drug Cartel, the main producer of synthetic drugs in Borduria.

Security Challenges – Zendan People's Army

- The leader of ZPA, Rupert Henzau is under sanctions and prohibited from entering Ruritania or holding any bank accounts or property in Ruritania
- Rupert Henzau has made statements in the past about the desirability of a weapon of mass disruption
- Rupert Henzau engages in disinformation campaigns about the Regional Radioactive Waste Facility, regularly alarming the local population with false information about levels of external radiation

Security Challenges – EKC Drug Cartel

- The main producer of synthetic drugs in Borduria is the EKC drug cartel
- The ZPA and EKC jointly undertake drug smuggling operations
- EKC has been identified by the security services as carrying out a ransomware attack on the Mercy Hospital in Ruritania in 2023

Increasing Tension – Patma Mountains

- A hit and run driver has killed two young children from the Zendan ethnic minority in Patma Mountain region. Video footage of the driver is circulated on social media. Locals attempt to take justice into their own hands, and the driver is rescued from a mob by police officers.
- A large protest is broken up by using tear gas. During the protests shots are fired at police and they respond with live ammunition – four innocent civilians are killed and scores injured when panic causes a stampede among the remaining protestors.
- The Mercy Hospital in the Patma Mountain region is inundated with injured people.

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Changes in the Threats. Beyond DBT?

The plenary discussion on civil unrest and protest underscored the need to assess the increased threat level in the region where radioactive sources are located.

Participants were asked by the facilitator about factors that would cause them to have increased concern about the assessed threat level and whether any of the circumstances discussed in this scenario would require security measures to be strengthened, particularly if these events do not occur near any site with significant radioactive material inventory.

Participants examined the difference between threat (adversaries) and risk (probability and consequences), which would assist them to assess the need for any compensatory measures in relation to the security of the radioactive sources. [4]These measures could include increased security personnel, enhanced surveillance systems, and additional training, establish proper inventory system, all of which would incur additional costs for the operator.

The regulatory authority's leading role was identified. Representatives of the regulatory bodies noted that this scenario would lead them to prioritize communication with the operator to ensure that operators were continuing to comply with their existing safety and security plans.

The issue of communication with the public was also discussed. The issue arose as to what the public should be told and the need to strike a balance between providing information and avoiding panic among the population.

Stakeholders' Responsibilities During Peacetime and During Active Conflict

The discussion began with a consideration of the responsibilities of competent authorities and operators during peacetime and wartime, and how these change with the increase in risk and threat depending on whether it is assessed as either Low, Medium or High. It was agreed that conflicts necessitate an extension of responsibilities beyond those defined by the DBT. This shift means that the licensee is no longer the sole entity responsible for addressing the threat, but rather, it becomes a collective responsibility of the licensee and State authorities.

During peace time radioactive source security is undertaken by civil authorities, but during war, the civil authorities are not in charge. One aspect of preparing for crisis response is the need to involve and empower different authorities. The discussion highlighted the importance of bringing the issue of nuclear security down to the grassroots level, making everyone aware and responsible.

Based on the National Nuclear Security Regime of Ruritania participants discussed their experience interacting with stakeholder bodies within the framework of national nuclear security regimes, their roles, and their responsibilities. In the event of a change in the functioning of the nuclear security regime from peacetime to wartime, new competent bodies, in this case, the military, would be added to oversee events.

Participants also discussed the role of coordinating bodies such as the National Nuclear Security Committee in Nigeria and the National Security and Defence Council of Ukraine, that play a crucial role in addressing such issues, providing valuable support and guidance.

[4] WINS International Best Practice Guide. Security of Radioactive Sources in Use and Storage, 2024 https://www.wins.org/document/security-of-radioactive-sources-in-use-and-storage/

Communication

Stakeholder meetings, such as the ones held in the Democratic Republic Congo, provide a platform for sharing updates and best practices.

Networking and connections between experts, as seen in Georgia, foster a collaborative approach to nuclear security. If martial law were imposed in Georgia, the regulatory body's main role would be to serve as a technical advisor to the military, who takes the lead during times of conflict.

An important factor is the establishment of cooperation and exchange of information on the status of the facility/material on site, its location, contacts with responsible persons, and local authorities. This underscores the urgency and significance of these actions in maintaining nuclear security.

DAY 2

National experience. Colombia's experience in ensuring the security of radioactive materials, Ministry of Mines and Energy

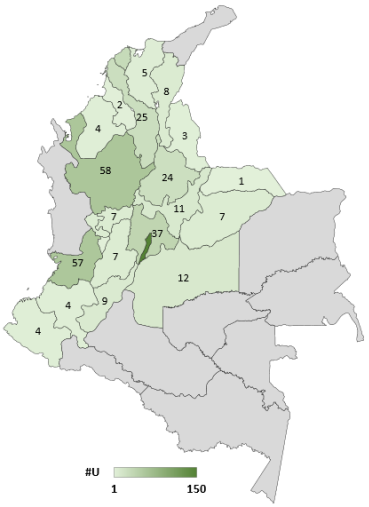
Colombia's experience with securing radioactive materials is unique due to an ongoing armed conflict that has been going on for the last 50 years and has had a significant impact on its security posture.

The representative of the Colombian Ministry of Mines and Energy, Ms Angela Zapata outlined the responsibility of the Ministry:

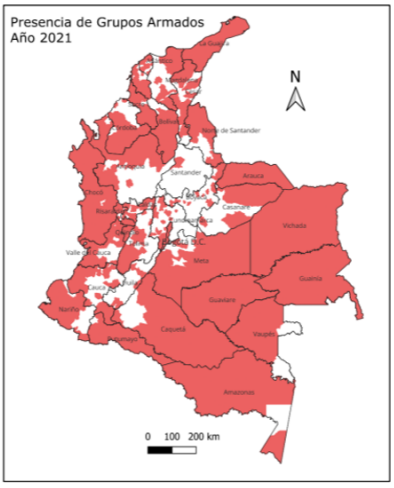
- Formulation of national policy on nuclear energy and radioactive materials.
- Promulgation of rules and regulations for the safe management of nuclear and radioactive materials in the country.
- Advising the Minister on the adoption of policy on nuclear energy and radioactive materials.

In her presentation, Ms. Zapata highlighted several cases of materials found during enforcement activities targetting illicit trafficking. She mentioned three cases from 2008, where materials were discovered during searches, and one successful operation in 2011 that recovered Iridium-192. This underscores the interest of criminal groups in radioactive materials.

Since 2002, Colombia has made notable progress in establishing regulatory control over radioactive material and improving communication among stakeholder bodies. An example of this progress is the transportation of radioactive materials, which is secured with the assistance of the military due to the serious threats posed by criminal organizations.



The map on the left illustrates the locations and concentrations of radioactive materials across various districts in Colombia. The map on the right displays the territories controlled by armed drug cartel groups.



Presence of illegal armed groups in 2021. Source: DAPRE (2021)

The Design Basic Threat is developed by the Colombian Ministry of Defense and the Ministry of Energy. Additionally, the Ministry has set up an Emergency Radiological Hotline that operates 24/7, allowing individuals to report any cases of radioactive materials found outside of regulatory control.

In her closing remarks, Ms. Zapata emphasized that maintaining communication between relevant authorities is crucial for effectively responding to incidents. She noted also that Colombia is continuously enhancing its security regulations with support from international organizations, including Interpol and the IAEA.

Scenario development, onset of active phase of conflict

Escalation by ZPA

- Operatives from ZPA based in Borduria cross Ruritania's northwestern border and carry out a complex coordinated attack
- ZPA affiliates inside Ruritania attack public transit stations as well as several government facilities
- As attacks continue, fear and panic among Ruritania's populace increase
- The Ruritanian government has underestimated the relative size of, training of, and weapons available to, the ZPA

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Preparation for Action in Times of Uncertainty and Crisis

It was agreed that an important aspect of preparedness for incidents involving radioactive sources is the status of each licensee's inventory of radioactive sources, including disused sources[5].

It was also agreed that national competent authorities should plan for and practice potential scenarios[6] in situations where an adversary might gain control of these materials, during an active conflict.

During the discussion the following issues were raised:

- How can this be applied in a war?
- Can the exact mechanism and approach be used in a war?
- What are the challenges?
- How do we effectively gather information from the military?
- How can we ensure timely information to better protect our assets?
- Is our response plan comprehensive and sufficient during active conflict?
- What other factors should the response plan cover to ensure our preparedness?

The participants agreed that the military, who is a key player in wartime, is not usually inclined to share information with civilian organizations. Participants also shared concerns that the composition of the National Security Committee often changes with government leadership changes, which significantly impacts the chain of command, culture, and response priorities. This underscores the need for a robust and adaptable security strategy[7].

[5] WINS International Best Practice Guide. Security of Radioactive Sources: Managing Disused Sources, 2024. https://www.wins.org/document/security-of-radioactive-sources-managing-disused-sources/

[6] WINS International Best Practice Guide. Management Competency and Training, 2022. https://www.wins.org/document/managing-competence-and-training/

[7] WINS Special Report. Sustaining Human Resources in the Area of Prevention, Detection and Response to Nuclear and Other Radioactive Material Out of Regulatory Control, 2022. https://www.wins.org/document/sustaining-human-resources-in-the-area-of-prevention-detection-and-response-to-nuclear-and-other-radioactive-material-out-of-regulatory-control/

Further Escalation by ZPA

- ZPA has successfully occupied the Northwestern section of Ruritania. This has led to the displacement of the Ruritanian population (ethnic majority)
- Ruritania is struggling to deal with continuous small scale attacks by ZPA.
- Through funds available from drug smuggling operations, ZPA has a large cache of military grade weapons and equipment.

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Extraordinary Actions in Active Conflict

The participants discussed the necessity to secure radioactive materials in place. The DOE representatives discussed the Secure in place (SIP)storage containers as an option for encasing sources in a retrievable form. These kits have been piloted by the US DOE NSSA GMS Office of Radiological Security and are ready to deploy.

In the absence of guidance, what do you do? There was a discussion based on dividing a country into 20 kms zones. So, what do you do if the first 20kms is captured and then the next 20 kms and then the next? If you lose control of your part of the country, you need to think about what you would do with radioactive material that is physically within that territory. For example, Georgia, Moldova, and Ukraine face occupation in certain areas of their country and they do not have control over the radioactive sources in the occupied territory.

The participants were encouraged to consider the potential of diplomatic solutions to remove or stabilize a radioactive source as a military operation to remove a source from an occupied territory is not realistic.

Conflict with ZPA Expands

- ZPA has now taken a large swathe of territory inside Borduria
- ZPA operatives are now pushing across the border into Ruritania beyond the Patma Mountain region
- There are now serious skirmishes at the border and Ruritanian security forces have sustained heavy losses
- The ZPA has now penetrated beyond the Patma Mountain region a further 50 - 75km into Ruritania

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Challenges to the Implementation of International Law in the Conflict Zone

The law of land warfare, including the Geneva Convention and its Additional Protocol[8], offers guidelines such as "no fire areas" for hospitals, refugee camps, cultural and religious buildings, schools, and nuclear facilities. In all cases, the consequences for civilians must be considered. When military forces do not respect the No-Fire-Area – these are violations of international law, which can lead to severe consequences such as international sanctions, loss of credibility, and increased risk of

[8] https://docs.un.org/en/a/79/174

conflict escalation.

But a key question is how to influence a hostile force to refrain from targeting radioactive material? How do you continue to monitor the safety and security of radioactive material that is within the territory of a hostile force.

Prepare Your Preparedness Plan in Advance

The one thing that we can do in the radioactive source security regime is monitor and develop contingency plans. **KNOW YOUR INVENTORY**. You need to accept that you may not be able to effect good nuclear security within your borders.

For effective response planning, inventory information should encompass more than just the type of material, its quantity, and associated activities. It should also include the location of radioactive materials—ideally accompanied by a map of the premises—details about responsible personnel, storage conditions, and usage guidelines.

This important action for the crisis response planning.

Establishing liaison officers between the military and other competent authorities is a crucial step. This ensures effective communication and coordination, fostering a good situation for all involved.

It is imperative to activate remote monitoring both within and outside the facility. This continuous oversight provides a sense of security and control over the situation.

Conflict Impacts Mercy Hospital

- The Mercy hospital is at full patient capacity but with limited staff
- The security staff at the hospital are reservists in the Ruritanian Defence Forces and have been recalled to duty
- The closest office of the RSSA is within the conflict zone and is currently closed for the safety of its personnel

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Some steps discussed by the participants that stakeholders can take to better prepare for securing radioactive sources in an escalation scenario include the following protective measures:

1. Strengthen security and enhance response capabilities, keeping in mind that this may not be feasible if the response force is depleting its resources.

2. Relocate the source when necessary, prioritizing based on potential consequences. For instance, cesium poses a greater risk of dispersion compared to cobalt.

3. Secure the source in place, using methods such as encasing small sources in cement to address immediate risks. It is also important to consider how to manage the materials properly once the situation stabilizes.

In Ukraine, for example there is a significant aerial threat. In these circumstances the considerations are which floor the radioactive sources are on– can they be moved to the basement. As the risks cannot be eliminated they can be reduced. Some considerations are the reduction of the inventory if possible or the protection of the inventory. Other considerations are power supply to your systems.

It was agreed that risk management in these circumstances requires an organization to consider its inventory, the location of the inventory, and the status of the protection system of the inventory of

radioactive material. It was recommended to take photographs to record any changes to the arrangements in relation to the inventory so there is a permanent record. Any records should be stored securely and able to be retrieved.

The Baltic countries offer a strong example of the importance of thorough preparation. What are the key triggers for enhanced preparations. It's crucial to start considering potential problems before they occur. Preparing contingency plans is essential for security reasons. One of the biggest challenges is communication loss. Effective communication between operators and regulators is vital. In a conflict situation, communication often deteriorates quickly. If you notice a change in the threat environment or receive intelligence indicating an increasing threat, it's important to focus on enhancing your preparation and response measures.

International experience. Presentation of the National Nuclear Security Administration (NNSA), U.S. Department of Energy (DOE) on the fostering resilience in radioactive source security

Dr Stacy Mui and Mr Chris Behan shared lessons learned on the promoting radiological security and emergency preparedness and response during times of increased threats and global instability with focus on:

- The importance of leveraging partnerships and capacity that have been built up during times of peace
- The need for flexibility and adaptability to adjust to changing dynamics
- Shifts in priorities and posture to meet emerging challenges
- The imperative to create more efficient coordination processes to cross-leverage expertise.

Through joint training programs, technology sharing, and collaborative exercises, NNSA have cultivated trust with international partners, shared goals, and institutional knowledge that have proven invaluable in moments of crisis. For example, through NNSA, DOE capacity-building initiatives was cooperated to strengthen radiological security measures and emergency preparedness and response across the globe from the former Eastern Bloc nations to the Far East, to Africa, and South America to help ensure that nations are better equipped and trained to identify and address threats before they escalate.

One of the most important lessons learned is that **partnerships must not be reactive; they must be proactive**. It is during times of peace that we must invest in relationships, build capabilities, and prepare for the challenges we know WILL come. In times of crisis, we can surge resources and capacity, but we cannot surge trust or partnerships if they do not exist.

The threats we face today are far more dynamic than they were even a decade ago and go beyond the normal design-basis threat for which most of us are prepared. Cyberattacks, the spread of misinformation/disinformation, the targeting of support infrastructure, and the use of advanced technologies such as drones have fundamentally changed the landscape of global security.

During war and violent civil unrest, referred to as "extraordinary times" in the WINS publication, we must assume that our standard operating and regulatory procedures are under extreme stress; the capabilities of the State are going to be restricted. How do we prepare for the loss of control? How do we prepare material outside of regulatory authority? Do you have a national response plan for a nuclear security event, even under "ordinary times"? Are you prepared to assess alarms - assuming they are not destroyed, assess information alerts, determine nuclear security events? During war? Or do you need to prioritize the highest consequence facilities and scenarios?

To address these evolving threats and this evolving landscape, NNSA has had to embrace flexibility and adaptability as core principles. We've upgraded physical protection systems, enhanced on and off-site response coordination, developed innovative approaches for tracking the status of radioactive sources and corresponding security, and promoted the adoption of non-radio-isotopic alternative technologies for permanent risk reduction

One of the more important lessons we have learned domestically, and that we promote with our international partners, is the necessity of having good lines of communication for reach-back to technical experts.

Governments need experts. Certified health physicists or perhaps, nuclear engineers. IAEA cannot respond to an immediate crisis. You must prepare to be nimble, flexible, and technically robust for any possible scenario.

The key takeaway here is clear: rigidity is the enemy of resilience. If we are to stay ahead of evolving threats, we must continuously innovate, plan for multiple scenarios, and remain willing to adjust course as needed.

As threats evolve, so too must our priorities and posture. Global instability demands that we reassess where we focus on our resources, what vulnerabilities we address, and how we position ourselves to respond. Crisis response to the war in Ukraine, this has meant placing greater emphasis on crisis management, remote sensing of radioactivity, the resilience of operating nuclear power plants and the grid, and capacity building.

Ukraine needed an upgraded ability to remotely monitor for possible radiation releases. You are all

probably familiar with the IAEA's International Radiation Information Monitoring System (IRMIS). Remote sensing of dose rates in an open-air environment in a war zone is difficult. It is expensive, it requires a Lot of manpower and equipment, it requires probabilistic risk assessment to determine where events are more likely to occur, and it requires 24hr technical reach-back for when an alarm activates. Radiation monitoring is not easy, and especially difficult in a war zone.

Our collective ability to reevaluate priorities and align resources in ways that maximize impact. As global instability continues to rise, we must work together to ensure that our strategies remain dynamic and responsive to the challenges ahead.

Tremendous opportunity for improvement: internal coordination. While the expertise within our organizations is vast, inefficiencies in coordination often limit our ability to fully leverage that expertise. Poor information sharing, duplication of efforts, and fragmented communication can hinder progress at a time when seamless collaboration is essential.

As we've seen in NNSA's response to the war in Ukraine, NNSA formed a task force to coordinate assistance to Ukraine. This allowed for a more centralized framework for information exchange, established shared platforms for collaboration, and brought together diverse perspectives and expertise from across NNSA and the entirety of the United States Government.

For example, while working with our Ukraine partners, we realized we had to think differently regarding possible vulnerabilities of nuclear facilities, such as nuclear power reactors in cold shut-down. This required expertise from across the U.S. government, not just within NNSA. We had discussions with experts from the Department of Energy, our national laboratories, the Nuclear Regulatory Commission, and our Environmental Protection Agency. To fully understand the vulnerabilities in Ukraine, we had to improve our own internal communication and collaboration across different parts of a large government.

The vision for the future is clear: we must break down barriers to collaboration, foster a culture of shared responsibility, and create systems that allow us to work together more efficiently. This is not just a matter of operational effectiveness-it is a matter of global security.

DAY 3

International experience. IAEA assistance during the armed conflict in Ukraine and Associated efforts to support the maintenance of nuclear security of radioactive material.

The IAEA has been monitoring and assessing the nuclear safety and security situation in Ukraine since February 2022. As Mr. Rober Officer mentioned in his presentation, there have been over 200 missions to Ukraine, approximately 300 public statements by DG Grossi about the situation, and 128 deliveries of equipment with support from Member States.

While nuclear security is primarily a national responsibility, the IAEA provides assistance at the request of countries to help establish and maintain effective nuclear security. This includes support in capacity building, guidance on standards, development of human resources, risk reduction, and facilitation of adherence to international legal instruments related to nuclear security.

During the Q&A Session with IAEA representative, Mr Robert Officer, participants discussed issues such as:

- The ITDB is a voluntary initiative, with Member States choosing to participate.
- The 2025 fact sheet has been released.
- The IAEA's support for Ukraine is unprecedented and highlights our commitment to treating all countries equally. IAEA prepared to provide missions and support as needed, regardless of a country's size or geopolitical situation. Ukraine's request for assistance was made through the formal channels of the Convention on Early Notification through USIE to the IEC.
- National threat assessment includes an assessment of the activities of both State and non-State actors.

Scenario development onset of active phase of conflict

ZPA Capture of Territory

- Parts of the border between Ruritania and Borduria are now controlled by ZPA.
- All radioactive sources are currently under the control of licensees.
- Hospital is still providing medical care with reduced staffing.
- RSSA assesses that, Cat. 1 Sources at the hospital and Cat 2 Sources for industrial use are at risk.

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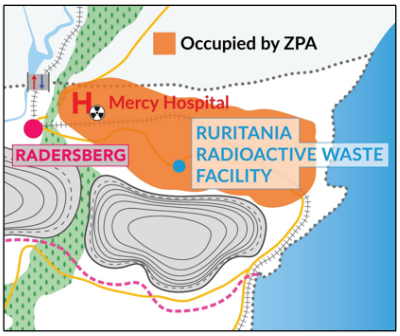
ZPA Control of Territory with Significant RM Inventory

- The ZPA has captured the area where the new RRWF is located.
- Regulator assesses that the (3) Cat. 1 Sources at the Mercy Hospital are in jeopardy as the hospital is now in the contested region, where both government army forces and the FPA are conducting combat operations
- Mercy Hospital remains open and functioning with reduced staffing
- The new Security Director has possible links to ZPA



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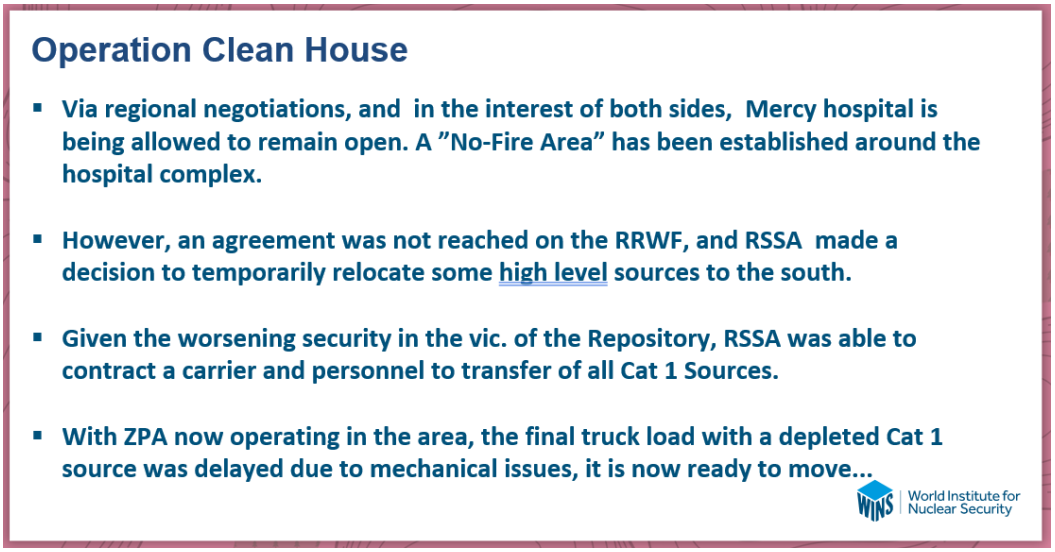
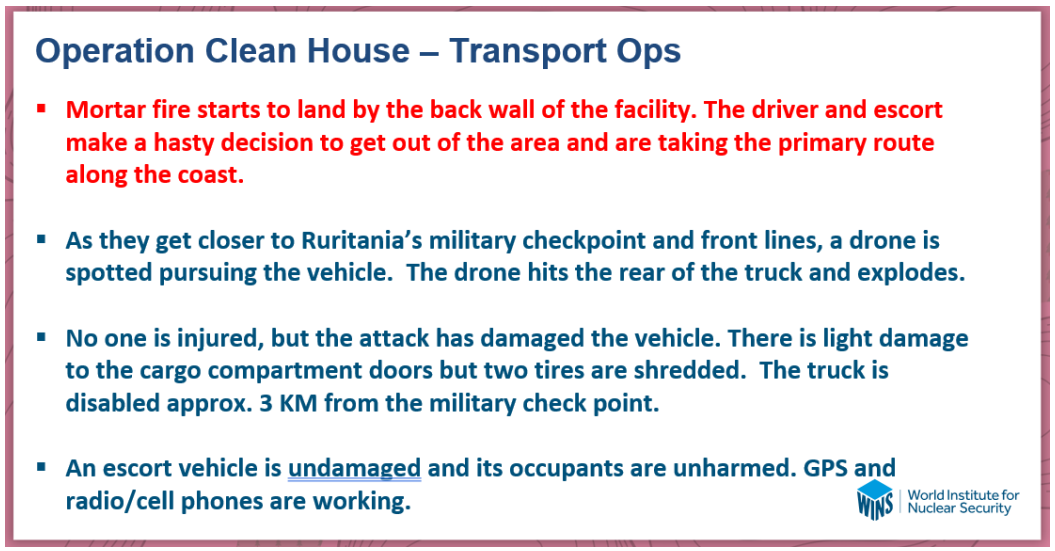




Responsibility Shifts During Active Conflict

The military typically controls communication during wartime, which includes phones, roads, railways, and other communication methods. There is no concept of shared responsibility in this context. The Government might consider the movement of materials even in challenging circumstances. Facilitating transport is crucial, especially since regulations often do not adequately address such movements in wartime.

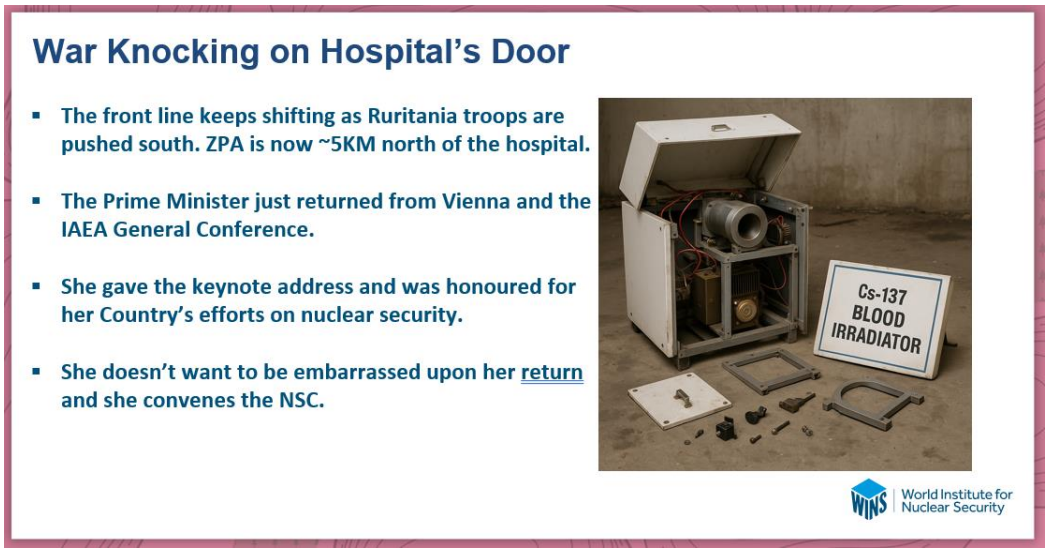
In normal transport operations, the operator is responsible for implementing the transportation plan. However, in high-risk transport operations including during active conflict the dynamics change considerably. Moving materials during wartime increases the risk due to the dangers associated with transport in conflict situations. Regardless of the context, whether during occupation or conflict, the safety and security of materials and personnel remain paramount. However, determining who is in charge can be complicated. In this case, a high-quality inventory conducted in advance will provide the necessary information for planning the relocation of materials.

Participants primarily focused on their operations during peaceful times and did not consider potential actions in the event of conflict. A key discussion point was regarding responsibility in the case of an incident during transportation: Who would be accountable? The operator, military, or regulator?

If there is agreement on the conflict regarding safety and security, it may be possible to conduct sensitive moves (e.g., transporting uranium in Kosovo between Serbia and Bosnia). In such cases, military and law enforcement agencies should take charge, coordinating with regulatory bodies to control the situation.

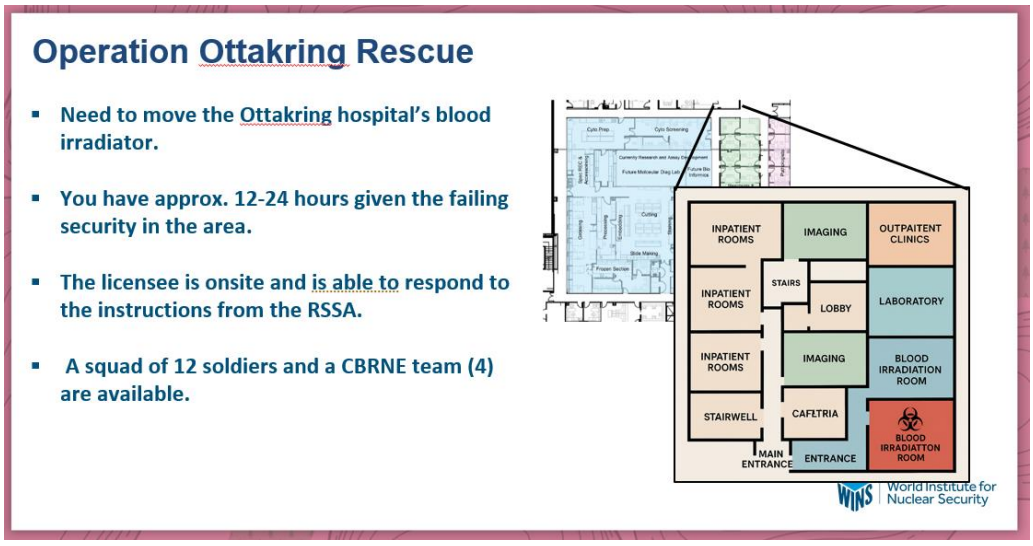
During transport operations, it is essential to contact checkpoints and follow the established procedures. Call the relevant authorities to request air defense protection and additional transport resources. After a drone attack, it's likely that more attacks may occur quickly. Drones have become a serious threat. In case of an emergency, reach out to a military base for assistance and potentially dispatch a new truck. Check the integrity of the source and any damage sustained.

ALTERNATIVE SCENARIOS



In another scenario involving the transportation of Caesium 137, information from intelligence and forces about the current situation and assessments is critical. The licensee can prepare the vehicle and request support, especially if planning to move materials to another country or the southern part of the country by sea. Shipments can be denied, so utilizing military shipping may be a better option.

It is important to note that no answer will be perfect. Securing materials starts at the source, including ensuring the safety of the equipment, room, and entire building.



Evaluate how much risk is present, even if the transportation is successful. Imagine a situation where materials are lost at sea after being packed up.

Burkina Faso representative shared their country experience on the movement of radioactive sources. Some facilities are in high-risk areas prone to terrorism. Last year, ORS helped provide an updated inventory of the facility. Despite the army's support, not all information was successfully obtained. This scenario could help enhance cooperation with law enforcement in the future, utilizing local focal points.

Theft of Truck with Radioactive Sources

- A truck with two well-logging sources has been hijacked by a criminal group to the west of the Capitol.
- The company HQ reports this to RSSA. The company is trying to negotiate with the criminals to pay a ransom for their employees and the vehicle with the sources
- It not known if this criminal group understands that it has captured radioactive materials as the company has removed placards from its vehicles given the heightened threat situation in the country

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Participants discussed next considerations:

- If the truck is found without radioactive material (RM), what actions should be taken to address the threat of a dirty bomb?
- Is there existing regulation or legislation that covers this?
- Who should participate in the response?
- Who leads the actions taken?
- What is the role of regulator / license / army / law enforcement / law enforcement here?

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Summary and key takeaways

A highlight of the discussion was the recognition of a paradigm shift from the main threat being non-state actors to a situation where the main threat is a state actor or a proxy group. This development is something all stakeholders are aware of, underscoring the need for heightened preparedness and a re-evaluation of national security strategies.

Participants discussed their national experiences regarding their national nuclear security infrastructure for the protection and control of radioactive sources, the role and activities og their national competent authorities, and their cooperation and response planning in peaceful and its applicability to active conflict.

It was agreed that the topic was very important. Active conflict in the area where radioactive sources are located goes beyond the planning assumptions related to peacetime and requires all assumptions to be examined and new scenarios to be exercised to ensure readiness.

Typically, the security of radioactive sources is managed by civil authorities. However, in times of war, civil authorities may not be in charge, necessitating a consideration of the responsibilities and empowerment required of various authorities and the potential shift in responsibility to military organisations.

Stakeholder meetings, such as National Security Committee meetings, provide platforms for sharing updates and best practices. This sharing encourages a collaborative approach to nuclear security, enhancing the collective preparedness of all participants.

Networking and fostering connections between experts, as demonstrated in Georgia, also contribute to this collaborative approach. Under martial law in Georgia, the regulatory body primarily serves as a technical advisor to the military, which takes the lead during conflict.

A paradigm shift is required to clarify the roles and responsibilities of competent and local authorities and to address prioritization and leadership during active conflicts. The joint exercise scenario serves as an important platform for exploring these issues.

Improving our contingency plans is CRUCIAL. We need to understand the difference between peacetime and wartime contingencies and how we can better prepare for both. One suggestion is to divide a country into 20 km zones. For instance, if the first 20 kilometers fall to the enemy, what actions should be taken next? How can we swiftly relocate radioactive materials? The contingency plan could be labeled an in-extremis removal operation, which demands immediate attention and action.

- Communication and dialogue among all stakeholders

Throughout the joint exercise, participants agreed that the security of radioactive materials in times of war can be achieved by communication and dialogue.

During wartime, the army controls all forms of communication, including phones, roads, railways, and other methods of communication. In regular transport operations, the operator is responsible for implementing the transportation plan. However, in high-risk transport operations, the dynamics change significantly. Moving materials during wartime increases risk due to the dangers associated with transport in both peaceful and conflict situations.

- Preparation and training

It was agreed that facilitating dialogue on new approaches to address emerging threats is vital. Our understanding of adversaries and their objectives is rapidly evolving, and the urgency of maintaining effectiveness in both human capacity and systems in the face of increasing threats cannot be overstated.

It was agreed that it is essential to emphasize that preparation and training are crucial for the sustainable operation of the country's nuclear security regime. These measures are not only important but also serve as the foundation of security.

During the joint exercise, participants were actively engaged in the learning process, experiencing the transition from "normal" threats to active conflict and the seizure of territories where Category I radioactive sources are located.

- Maintenance of Radioactive Source Inventory

An essential aspect of preparedness for incidents involving radioactive materials in an active conflict is maintaining an accurate inventory, including that of disused sources.

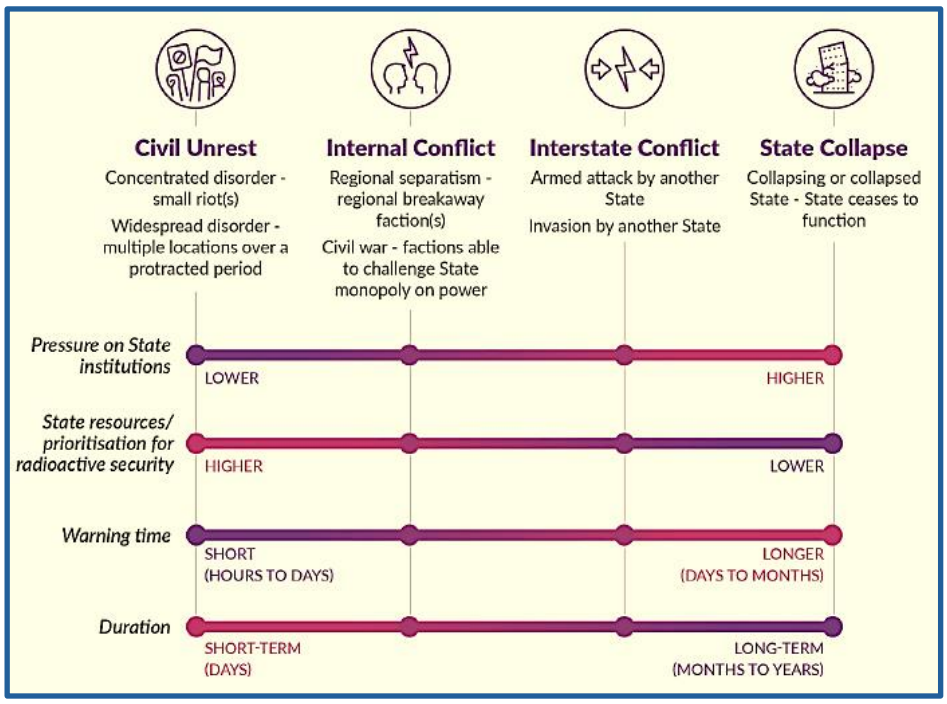
Inventory processes are generally similar across different contexts and mapping these processes aids in conducting search operations later. However, this information must be protected, as it is sensitive. Key considerations include assessing how much time is available and what the specific threats are to make informed decisions. Comprehensive risk management begins with a clear understanding of the materials you have, their locations, and how they can be protected. This knowledge is the foundation for effective risk mitigation strategies.

It is crucial to take inventory of materials and ensure the accuracy of information regarding their type, quantity, and exact locations. Taking photographs of where these materials are stored can help in understanding the environment.

- Legal framework

International law related to land warfare, including the Geneva Convention and the Additional Protocol, offers guidelines such as no-fire zones for hospitals, refugee camps, cultural and religious buildings, schools, and nuclear facilities. It is imperative to bring all pressure to bear on military operatives to prevent the targeting radioactive material.

The following graphic is taken from the WINS Special Report Securing Radioactive Sources During War Time and Violent Civil Unrest[9] and depicts the different considerations due to escalations in active conflict.



The national and international landscape is evolving, and we must be prepared for the modern threats and risks that this new reality presents. Some countries, like Colombia and Ukraine possess more extensive experience in securing radioactive sources during wartime or periods of violent civil unrest. This expertise could become a valuable resource for enhancing resilience in radioactive source security and for guiding future preparedness and response efforts to nuclear security incidents during active conflicts.

[9] https://www.wins.org/document/securing-radioactive-sources-during-war-time-and-violent-civil-unrest/

Agenda

DAY 1: Monday 5 May 2025	
08.30-09.00	**Registration**
09.00-09.20	**Introductory Session** Opening Remarks by Ms Rhonda Evans, WINS Overview by facilitators, Mr David Duhamel and Dr Stacy Mui
09.20.10.15	Brief introduction of participants (2 minutes each) **Name, Organisation, Country, Role in radioactive source security**
10.15-10.45	**Seminar topic: Ukraine's perspective: Peace time vs Active Conflict:** Mr Oleksandr Puchkov, Security Service of Ukraine
10.45-11.00	**Group photo**
11.00-11.15	**Coffee Break**
11.15-12.30	**Joint Exercise –National Systems**
1230-13.30	**Lunch**
13.30-15.00	**Joint Exercise - Fictional Scenario**
15.00-15.15	**Coffee Break**
15.15-16.30	**Joint Exercise – Fictional Scenario**
16.30-17.00	**Debrief of Day 1**
18.00-19.30	**Reception**

DAY 2: Tuesday 6 May 2025	
09.00-09.15	Recap of Day 1 and brief of Day 2
09.15-09.45	**Seminar topic: Colombian perspective: Peacetime vs Active Conflict** Ms Angela Zapata, Ministry of Mines and Energy, Colombia
09.45-11.00	**Joint Exercise – Fictional Scenario**
11.00-11.15	**Coffee Break**
11.15-12.30	**Joint Exercise – Fictional Scenario**
12.30-13.30	**Lunch**
13.30-14.45	**Joint Exercise - Fictional Scenario**
15.00-15.15	**Coffee break**
15.15-15.45	Mr Chris Behan and Dr Stacy Mui, National Nuclear Security Administration, United States Department of Energy
15.45-16.30	**Q&A and Debrief of Day 2**

DAY 3: Wednesday 7 May 2025	
09.00-09.15	Recap of Day 2 and brief of Day 3
09.15-09.45	Mr Robert Officer, Division of Nuclear Security, Department of Nuclear Safety and Security, IAEA
09.45-11.00	**Joint Exercise – Fictional Scenario**
11.00-11.15	**Coffee Break**
11.15-12.30	**Joint Exercise – Fictional Scenario**
12.30-13.30	**Lunch**
13.30-15.00	**Joint Exercise – Fictional Scenario**
15.00-15.15	**Coffee break**
15.15-16.00	**Closing remarks, wrap up and certificates**
16.00	**Workshop end**

Menti Survey Feedback

Mentimeter was used to collect feedback from participants on their satisfaction with the event and valuable insights and suggestions for improving the workshop. The results were overwhelmingly positive, with 90% of participants expressing their satisfaction with the workshop and its objectives. 84% of participants found the seminar context to be relevant to their work issues. 96% of participants were able to expand their professional network. Importantly, 83% of participants expressed their intent to use the materials received to improve the safety of radioactive materials, indicating that the workshop's content was not only relevant but also practical and useful.

Participants provided the following comments on the most valuable aspects of their participation in the workshop:

- The scenario discussion
- Great participation by all! Very ative!
- The scenarios, expirience of the speakers
- Knowledge sharing
- Scenarios beyond DBT, anther thinking
- Completly new perspective given by professionals with different backgrounds and expiriences
- Creativity of scenarios
- Was ok. Thank you!
- Enriched my perspsctive on collaborative approaches to secure transport parations
- Getting expirience from speakers and other countries
- Free Discussion on the table sharing expiriences
- Brainstorm maker me die
- To be put into sutiation with a precise scenario to try and react ina team
- The diverse expiriences of the participants shared during scenarios an the creativity if the facilitators as well as the networking
- Everything about this workshop is highly valuable/ The think out the box idea
- The complexity of the scenario that was adapted each day

Proposals on the improvements includes next ideas:

- Invites more participants with different roles in nuclear security regime
- It can be planted in escalation scenarios. From the simplest to the most complicated
- Distribute scenario step by step
- Switch teams more often encourage sharing different perspectives
- No, it is good enough for my brain health
- Continue this work
- Multidisciplinary groups from the beginning
- It is a very professional and cognitive workshop
- Less carbo foods
- It’s complicated!

- By distributing the full scenario for each step
- Increase the number of participants to include the military and more intelligence operatives
- It should take more days; even more scenarios and it should be considered that one excellent report could be an outcome of this workshop
- More context and clarity in the proposed scenarios
- By including scenarios of actual conflicts
- By having practical simulation exercise