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RECOGNIZING AND REDUCING RISKS From Ammunition and Explosives

By Martina Salini and Samuel Paunila [Geneva International Centre for Humanitarian Demining]

The Geneva International Centre for Humanitarian Demining (GICHD) first engaged in the stockpile management of conventional ammunition in 2013 and has since developed in-house technical, operational, and strategic capabilities for ammunition through-life management. The GICHD is an active supporter of the ammunition management community of practice, and has authored and contributed to articles on this topic, including raising awareness of ammunition safety and security concepts.¹ The GICHD also collaborates with the Center for International Stabilization and Recovery (CISR) at James Madison University by jointly managing the Collaborative Ordnance Database Repository (CORD). This article discusses ammunition and explosives management from global to state levels and examines risk reduction in this setting, building on the experience of the Ammunition Management Advisory Team (AMAT) response mechanism—a joint initiative of the GICHD and the UN Office of Disarmament Affairs (UNODA) since 2019.

In the past decade, states around the world have become aware of the safety and security risks associated with explosive ordnance (EO)² and the consequences associated with poor management practices. Today, an increasing number of states are ready to discuss the sensitive topic of risks associated with their stockpiled EO and seek technical assistance toward reducing those risks.

Implementing a risk management system is vital for any state holding EO, from the early stages of procurement through to the stockpiling, use, and disposal of those munitions. As such, a good risk management system extends to the entire life cycle of EO and is integrated within the framework of national regulations and procedures. It is comprehensive and effective but not necessarily resource-intensive nor technically difficult to implement.

The global frame of reference for managing ammunition, the International Ammunition Technical Guidelines (IATG), was developed

and made publicly available in 2011 to assist states in addressing inherent risks stemming from stockpiling ammunition according to their capacity and available material, financial, and technical resources. The IATG contain an integrated risk management system, providing concrete guidance to technical and policy practitioners on risk-management principles and processes, as well as procedures to guide risk-based decision-making in ammunition management.

Alongside these guidelines, states and organizations specializing in ammunition through-life management are also known as the “ammunition management community of practice.” This article builds on the experience of the AMAT, a joint initiative established in 2019 by the GICHD and UNODA, to assist states in enhancing ammunition safety and security by managing risks from EO as per the IATG.

Global Attention to Ammunition and Explosives Risks

The safety and security risks pertinent to conventional ammunition management have captured the attention of states’ arms-control bodies as well as humanitarian and development circles. Connecting dots between these risks and sustainable development goals (SDGs) at the policy level, this topic has taken center stage in international, regional,

and, less visibly, national debates.³ Direct testimony of this are the two Groups of Governmental Experts (GGE) on Ammunition established by the United Nations General Assembly. Established in 2008, the first group looked at technical aspects of ammunition stockpile management. The work of the GGE resulted in the development of the IATG,

In the long run, for a state to maintain safe and secure ammunition and explosives stockpiles, the risk management process must guide the development and implementation of a national strategy and standards, as well as advise the competent authority and dedicated work force.¹⁴

and gave birth to the United Nations SaferGuard Programme to maintain, update, and disseminate the guidelines.⁴ The second ammunition GGE commenced its work in 2020 and is scheduled to hold its third and final session in September 2021. The second GGE's recommendations, which will address challenges pertaining to through-life management and security issues across the ammunition supply chain, will be presented to the UN General Assembly for consideration later in the fall of 2021.

As discussions continue towards safer and more secure ammunition stockpiles, states' demands for technical and financial assistance have been on the rise. In the past, a small group of states provided assistance that was largely a bilateral affair between the donor and recipient states' militaries, comprising training of personnel in ammunition depots, and technical advice in physical security and stockpile

management (PSSM). Over the past decade, a handful of international, regional, and nongovernmental organizations further developed their capabilities and became heavily invested in direct assistance to states in ammunition management.⁵

In addition to bilateral assistance, states in need of assistance are also submitting their requests through sub-regional, regional, and international channels. In 2020 alone, ten states submitted requests for assistance with ammunition management to the United Nations in their national reports on their implementation of the UN Programme of Action (PoA) on Small Arms and Light Weapons.⁶ Meanwhile, in the midst of the global COVID-19 pandemic and associated, competing national priorities, five states requested assistance from AMAT with their stockpiled ammunition.

Lessons Learned

Whenever inherent risks are not properly addressed, stockpiled EO pose two distinct threats to local communities, armed forces, the economy, and society at large: the risk of accidental explosions and the risk of diversion. Mass explosions can result in people killed, injured, or displaced, and have significant socioeconomic consequences. Additionally, diversion of EO from stockpiles—in-transit and during transfer—leads to unchecked proliferation, which has proven to be a catalyst for conflict and a contributing factor to the escalation of armed violence in several regions of the world.⁷ Diverted EO has further been systematically used to assemble improvised explosive devices (IEDs).⁸

The latest available data confirms the gravity and persistence of safety and security risks arising from ineffective stockpile management: the Small Arms Survey (SAS) recorded 242 unplanned explosions at munition sites (UEMS) over the 2010–2019 period, of which 39 took place in Africa, 16 in the Americas, 116 in Asia, 70 in Europe, and 1 in Oceania.⁹ Similarly since 2011, Conflict Armament Research (CAR) has documented approximately 7,500 cases of ammunition diversion.¹⁰ Furthermore, in 2018 alone, IEDs used by non-state actors were responsible for 9,366 civilian casualties in forty-nine countries.¹¹

Too often, post-explosion investigations report how an accident could have been easily avoided and its impact minimized, if risks inherent to EO had been better understood, appreciated, and managed. Hence, risk management should be perceived by states as a fundamental measure to prevent accidental explosions, unauthorized access, and diversion.¹²

Effective risk management within this context is a joint undertaking by technical and policy practitioners: a process initiated with a state understanding the nature of the risks involved, appreciating their magnitude in the surrounding environment and communities, and anticipating their consequences if materialized.¹³ Sound technical knowledge of EO as well as good management practices should be required from the outset. In the long run, for a state to maintain safe and secure ammunition and explosives stockpiles, the risk management process must guide the development and implementation of a national strategy and standards, as well as advise the competent authority and dedicated work force.¹⁴

Managing Risks, Mitigating Threats

While risks inherent from stockpiling EO cannot be entirely eliminated, the likelihood of an accident can be reduced to as low as reasonably practical, and its effects can be mitigated. Similarly, the likelihood of diversion can be reduced to near zero. Across its modules, the IATG

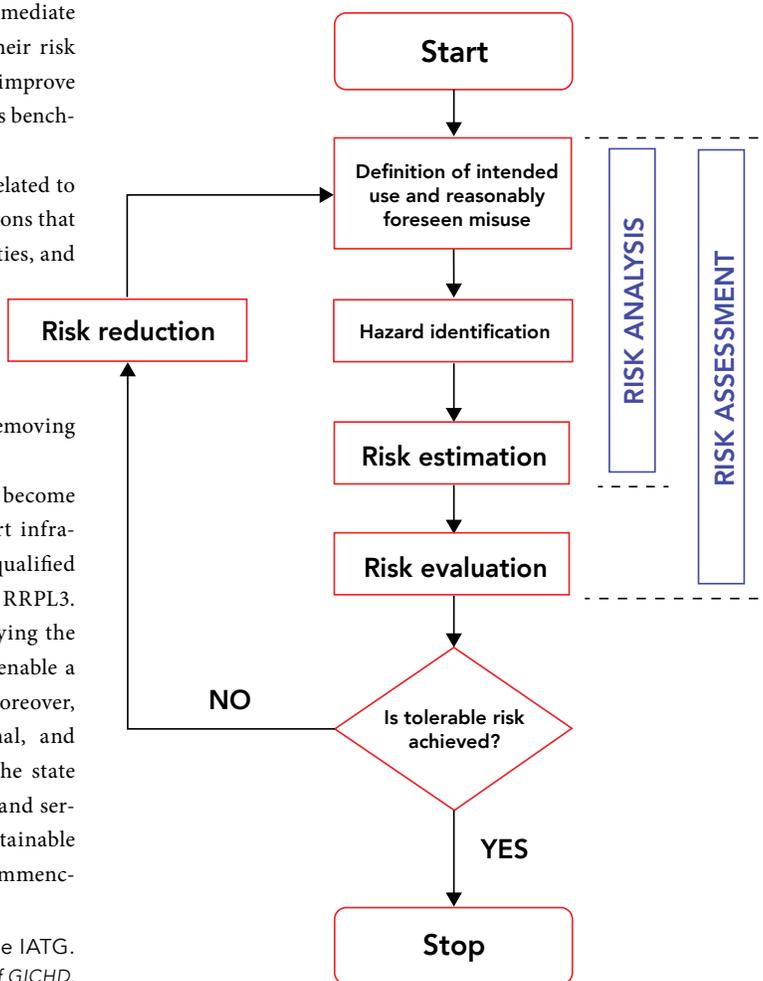
are strong in practical risk management¹⁵ and structured around gradual improvements considering the diversity of states' capacities and available material, financial, and technical resources.¹⁶ Modules use three levels of gradual ascending compliance, also known as

risk reduction process levels (RRPLs): basic (RRPL1), intermediate (RRPL2), and advanced (RRPL3). All states, regardless of their risk baseline and financial and technical capacities, can assess and improve management processes based on the IATG, using the RRPLs as benchmarks to work toward.

At a minimum, states should aim to maintain processes related to stockpiles at RRPL1. This implies the adoption of low-cost actions that do not often require extensive technical and material capabilities, and can be easily implemented to improve the safety and security of EO. For example, the guidance to achieving RRPL1 entails storing weapons and ammunition separately, segregating certain ammunition types from others in storage and transport, regularly ventilating explosives store houses, and removing vegetation around them.

Forward-planning is important. When more resources become available, a state can upgrade its storage facilities, transport infrastructure and surveillance processes, and fill the deficit in qualified ammunition personnel—gradually advancing to RRPL2 and RRPL3. Acquiring knowledge (e.g., through staff training) and applying the IATG (i.e., risk management principles and processes) will enable a state to identify specific challenges, capabilities, and gaps. Moreover, communicating these in appropriate national, sub-regional, and regional forums may bring expert advice and services to the state from other states and specialized actors. By using the IATG and services made available, a state can establish realistic and sustainable action plans and/or a strategy toward closing the gaps and commencing its implementation.

Image 1. Iterative risk-reduction process in the IATG.
All graphics courtesy of GICHD.



Risk Reduction in Select States

Significant differences in states' subject knowledge and management practices continue to be observed; however, a growing number of countries seek international assistance, communicating challenges and capability gaps. Some also prioritize risks with aging, unstable, and obsolete ammunition stockpiles—proactively planning for risk reduction.



Peru. Peru was the first country to approach UNODA for assistance from AMAT. As part of the process for their Institutional Transformation (2020–2034) plan, Peru is taking its first steps in aligning its policies and practices with the IATG. After delays caused by the COVID-19 pandemic travel restrictions and lockdowns, AMAT is now able to assist Peru with its ongoing efforts. Currently, nearly seventy war materiel army officers have been trained on the IATG,¹⁸ and deployed in-country in various management and regulatory functions.¹⁹ With technical assistance from AMAT, Peru plans to update and streamline the regulatory framework between branches of the military into a set of national standards for ammunition management, as stipulated by national legislation. These multi-year activities with key ministries and armed forces will be accompanied by further training. Additionally, Peru, in

partnership with the Spanish Ministry of Defence and AMAT, will conduct risk assessments of ammunition storage facilities.



Mauritania. In response to a request from the Republic of Mauritania for technical assistance in late 2020, AMAT carried out a preliminary assessment mission in support of the *Programme National de Déminage Humanitaire et de Développement*²⁰ (PNDHD). Through this assessment, AMAT visited eleven storage areas, identifying capabilities, risks, and needs in weapons and ammunition management. The assessments were conducted against the baselines from the IATG and the Modular Small Arms Control Implementation Compendium (MOSAIC). Following the mission, short- and longer-term recommendations were submitted to the PNDHD, aimed at gradually improving safety and security management. Pending relaxation of COVID-19 travel restrictions, AMAT's plans with Mauritania include a follow-up mission to implement recommendations.



Moldova. For nearly two decades, the Ministry of Defense of Moldova, with support from the international community, has implemented a program to secure and make safe its ammunition stockpiles largely inherited

following the fall of the Soviet Union.²¹ Significant steps have been taken to make the management more systems-based, effective, and responsive to risks. This has included bringing ammunition-related policies and practices in line with IATG practices. For example, Moldova has gradually reduced the number of ammunition storage locations from eighteen to five, involving surveillance, transport, and disposal of dysfunctional, unsafe, and surplus ammunition.²² Yet, aware of the magnitude of the remaining challenge, the Ministry of Defense requested in 2020 that AMAT review the PSSM program's progress as well as Moldova's National Army Action Plan 2020–2024. In response, AMAT visited Moldova's ammunition facilities in October 2020 and, in May 2021, convened a technical workshop for Moldovan experts in Geneva in July 2021, raising government awareness on ammunition through-life management and effective safety and security risk reduction measures.



Equatorial Guinea. In March 2021, a series of explosions rocked the city of Bata, Equatorial Guinea, resulting in more than 100 deaths and 600 injured. The explosions annihilated the military camp housing the storage facilities in which the explosions originated and destroyed more than 200 buildings in the surrounding areas. Following the explosion, Equatorial



Image 2. Delivery of a virtual training course on the IATG to the Peruvian Army.

Guinea requested technical assistance from UNODA's Regional Centre for Peace and Disarmament in Africa, which resulted in UNODA activating the quick response mechanism of the UN SaferGuard Programme. Within three days of the request, AMAT deployed and tasked an expert team to Bata to assist in determining the cause of the incident; identifying further explosion risks through a rapid risk assessment on the ground; assisting in reducing the risk of further explosion incidents through technical advice on risk-mitigation measures; and providing technical support recommendations to the United Nations in light of the coordinated bilateral offers of assistance from other states and organizations. During and after the mission, the team made next-step recommendations, which the government of Equatorial Guinea approved. These included a training program in EO safety and security; a new design and relocation of storage areas away from populations; and development of national standards and legislation for EO management.

Of these examples, Peru, Mauritania, and Moldova manifest a proactive approach to risk reduction. While each country has differing capabilities, the challenges, baselines, and inherent risks from EO are the same across countries. Such proactive approaches to reducing risks in states are important, especially when comparing the costs of maintaining an effective ammunition through-life management system. This is exemplified by the devastating series of explosions in Equatorial Guinea where, besides the tragic loss of life, the estimated cost for recovery runs in to the hundreds of millions USD.²⁴



Image 3. Meeting between AMAT and the Armed Forces of the Republic of Moldova.

Difficult but Passable Road Ahead

In contrast to earlier observations of positive change vis-à-vis states' efforts to reduce risks, and despite the availability of the IATG, the root causes of the recent, avoidable humanitarian disasters bear witness to the under-appreciation of the safety risks associated with EO—both military ammunition and commercial explosives. Lack of action by authorities is often explained as an absence of advanced technical knowledge and insufficient financial resources. However, all states

have access to the IATG and may seek assistance from the community of practice, e.g., UN SaferGuard Programme, regional organizations, other states, or through a dedicated response mechanism such as AMAT.²⁵ Additionally, states may take advantage of financial assistance mechanisms and trust funds through which technical assistance can also be channeled.²⁶ For many states, the road to progressive and sustained risk reduction is long and winding but passable.



Image 4. AMAT expert (right) and United Nations Disaster Assessment and Coordination CBRNE²³ specialist conducting post-explosion investigation at the blast site in Bata.

Conclusion

The importance of recognizing the inherent risks posed by stockpiled EO and the potential consequences stemming from inadequate reduction of such risks cannot be understated, marking a state's first step in questioning the adequacy of its policies and standards for conduct. The IATG's RRPLs offer milestones to work toward, gradually bringing the different components of EO management in line with international good practice. When performed well, through-life management of EO is a costly affair; yet implementing a system for risk reduction is not overly technical or resource intensive. Integrated

into a state authority's logistics management processes, proactive risk reduction prevents UEMS and diversion—saving lives and property. It instills security, accountability, and even slows degradation of stock while lessening the impact of risks materialized—human, material, financial, political, environmental, or reputational. Among other mechanisms for assistance, AMAT and its partners stand ready to support states with their stocks of EO, ensuring that they are safe, secure, and fit-for-purpose. ©

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Samuel Paunila leads AMAT, a global mechanism to assist states in the safe, secure, and effective ammunition management as per the IATG. Established in 2019, AMAT is a joint initiative of the GICHD and the UNODA. Paunila has worked with explosive weapons and armed violence reduction in humanitarian, peace-keeping, and military contexts for twenty years in Africa, Asia, the Americas, Europe, and the Middle East. Initially an ammunition and weapon systems officer with the Finnish Defence Force, he holds a master's degree in Resilience from Cranfield University, Defence Academy of the UK.

ENDNOTES

Recognizing and Reducing Risks From Ammunition and Explosives

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2. The International Ammunition Technical Guidelines define explosive ordnance as “all munitions containing explosives, nuclear fission or fusion materials and biological and chemical agents. This includes bombs and warheads; guided and ballistic missiles; artillery, mortar, rocket and small arms ammunition; all mines, torpedoes and depth charges; pyrotechnics; clusters and dispensers; cartridge and propellant actuated devices; electro-explosive devices; clandestine and improvised explosive devices; and all similar or related items or components explosive in nature.”
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15. United Nations Office of Disarmament Affairs (2015), *IATG: Introduction to risk management principles and processes*, mod. 02.10. <https://bit.ly/3lkGTjV>.
16. United Nations Safeguard Programme (2019), *A Guide to Developing National Standards*, p. 16, <https://bit.ly/39126cL>.
17. AMAT advice and services are triggered with a request for assistance from a state or an organization. The analysis of the request often warrants desk research and a risk assessment, resulting in the design of a response package or a programme for the state to reduce risks from ammunition and explosives in the short and long term
18. The course covered the following modules of the IATG: IATG 01.10 Introduction to the IATG; Ammunition Safety Management – Theory of Explosives and Ammunition Classification, Causes of Explosions; IATG 01.50 UN Hazard Classification System; IATG 02.10 Introduction to Risk Management Principles and Processes; IATG 03.20 Lotting and Batching; IATG 02.20 NEQ Quantity Distance calculation exercises; IATG 02.30 Explosive Limit Licensing; IATG 09.10 Security of Ammunition Storage Areas; IATG 06.20/30 Storage and Handling; and IATG 05.30 Barricades.
19. As per the feedback compiled to date 27 May 2021, from sixty-two trained army officers ranked from lieutenant to general (fourteen women, forty-eight men).
20. The PNDHD is the national authority responsible for ammunition management in Mauritania.
21. The countries supporting Moldova were organised under the Multinational Small Arms and Ammunition Group (MSAG) and include Austria, Canada, Germany, Sweden, Switzerland, and the United States.
22. Approximately 1,900 metric tons of ammunition have been destroyed since 2004.
23. Chemical, biological, radiological, nuclear, and high-yield explosives (CBRNE).
24. OCHA/UNDAC (United Nations Disaster Assessment and Coordination team), unpublished daily situation reports, 20-25 March 2021.
25. Contact AMAT via amat.gichd.org or [UNSaferGuard.org](https://unsafeguard.org)

26. For example; Arms Trade Treaty Voluntary Trust Fund (ATT VTF), The Saving Lives Entity (SALIENT), UN Trust Facility Supporting Cooperation on Arms Regulation (UNSCAR), etc.