Professor, SVAJONĖ BEKEŠIENĖ, General Jonas Zemaitis Military Academy of Lithuania, Silo 5a, LT-10322 Vilnius, Lithuania, no co-authors, Enhancing Small Arms Effectiveness through NATO Battlefield

Lessons and Soldier-Focused Design Principles, The modernization of small arms is a critical element in maintaining force readiness and ensuring operational superiority across evolving battlefield environments. This study explores how insights gained from recent NATO deployments—particularly those conducted in asymmetric and urban warfare contexts—can inform the strategic direction of small arms development. Drawing upon after-action reports, user performance feedback, and coalition force evaluations, the research identifies key shortcomings in legacy small arms platforms, including issues related to ergonomics, modularity, lethality, reliability, and adaptability. Through a comprehensive analysis, this paper highlights four primary drivers in the modernization of small arms: Reliability (F4), Modern Design and Appearance (F1), Bullet Power (F2), and Weapon Platform (F5). These factors were found to exert significant influence on weapon system performance and user satisfaction. The findings underscore the need to integrate advanced materials and engineering approaches to enhance durability and operational reliability. Additionally, a shift toward modular weapon architectures is emphasized, allowing for rapid customization to meet diverse mission requirements. Ballistic optimization remains another priority area, with a focus on increasing precision and stopping power while minimizing system weight and recoil. Crucially, this study advocates for a soldier-centered design philosophy that incorporates ergonomic considerations, intuitive interfaces, and feedback from active personnel to ensure usability under real-world combat stressors. Looking ahead, NATO’s emphasis on interoperability, standardization, and innovation will be essential to future development trajectories. Strategic modernization efforts must therefore align technological advancement with practical battlefield requirements, ensuring that small arms remain relevant, effective, and adaptable in an era of complex and rapidly changing threats.