

A Selection of Work from the 2024 FA52 Qualification Course

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Army Nuclear and Countering WMD officers, commonly referred to as Functional Area 52 (FA52) officers, are influencing and leading the nations strategic deterrence decisions. They leverage their experience and technical competence to advise Army senior leaders and policy makers on nuclear and Countering Weapons of Mass Destruction (CWMD) matters.

Each year, the FA52 proponent seeks highly-qualified mid-grade officers from across the Army to join the ranks of the FA52 cohort. The officers represent a broad cross-section of Army tactical experience and each exhibits the capability to serve at the strategic level as advisors to senior leaders facing critical and complicated WMD dilemmas.

The Functional Area 52 (FA52) Qualification Course is conducted annually to prepare FA52 officers for assignment to operational and strategic positions across the Department of Defense. The course focuses on four functional competencies:

- US nuclear policies and arms control treaties
- Nuclear & CWMD planning
- Nuclear weapon design, effects, and sustainment requirements
- Nuclear & CWMD RDT&E capabilities

None of these competencies are of any use to senior leaders without the ability to apply them to

critical problems being faced by the Department. For this reason, the FA52 course also includes a capstone exercise where groups of FA52s each address a complex and nuanced problem that is representative of the kind of dilemmas that they will encounter at their upcoming assignments. The students spend the entire two month course studying their assigned problem and developing a proposed solution which they present to a panel of senior leaders during the final week of the course.

What follows is a summation of the solutions presented by the FY24 FA52 Qualification Course students to strategic questions facing DOD senior leaders. The answers they provide are thoughtful, insightful and ultimately very actionable—some of the students from this year's class are already operationalizing these ideas within their current assignments.

We're excited to present their work to you as the first of their many contributions to come within the DOD nuclear and CWMD enterprise.

You can find more information about the Functional Area 52 career field at the US Army Nuclear and CWMD Agency website: <https://www.usanca.army.mil/>. ■

How might the emergence of land-based long-range precision fires change the land component commander's role during operations against a nuclear-armed adversary?

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American strategy for conventional war from World War II to the present day has emphasized the development of overwhelming force and the integration of aerial fires into ground operations in both the close and deep fight.¹ Near-peer competitive powers, namely Russia and the People's Republic of China (PRC), as well as persistent threats such as North Korea (DPRK), have observed this pattern and have focused substantial efforts on developing credible anti-access area-denial (A2/AD) systems to defeat these strategies.² Working in concert, the combination of advanced hostile surface-to-surface and surface-to-air A2/AD systems enable competitors to inhibit American military intervention.³ The future Joint Operating Environment is characterized by robust A2/AD systems meant to prevent operational targeting of key adversary systems. These developments have led the Joint Force to re-examine the utility of long-range precision fires (LRPF) to counter the threat of A2/AD systems and to develop capabilities for the Army to employ these systems against strategic threats in order to facilitate the A2/AD fight at the land component command (LCC) level.

The first consideration with the advent of LRPF is that they dramatically expand the JFLCC commander's area of influence for lethal fires. LRPF may allow the JFLCC commander to strike from beyond the region of conflict, and potentially even outside of the geographic combatant command's AOR. While the introduction of LRPF at the LCC level appears as a primarily improvement in the assets available for fires, it has significant impacts on all warfighting functions as the JFLCC is forced to establish the capability to direct and deconflict fires across vast distances while protecting and sustaining widely-dispersed critical assets.

A second major consideration is the process of target prioritization, identification, and engagement particularly in a contested and resource constrained environment. As demonstrated in the Ukraine conflict, potential targets will overwhelm available munitions.. This raises dilemmas: are available munitions solely reserved for the highest priority targets, or is a positively identified target of lower priority an

acceptable use of a limited resource? While the targeting cycle can account for these questions, the probability of degraded C2 and the tyranny of distance will likely introduce friction to that cycle.

An additional targeting concern is that it is possible that some of the key targets for LRPF are dual-use systems, capable of delivering both conventional and nuclear munitions. This raises a concerning question: will an adversary view the engagement of a dual-use system as an escalation? And given the possibility that an adversary will view it as an escalation, where is the authority for this strike held? Currently, JP 3-60 *Joint Targeting* indicates that sensitive targets must be vetted by the President or the Secretary of Defense—but doctrine does not explicitly identify dual-use systems as a category of sensitive target.⁴

A final concern is the possibility that LRPF strikes against targets located within the sovereign territory of a near-peer asset may be viewed as an escalation. Given the long range and integration of adversary A2/AD systems, it may not be practical to accept the risks created by declining to strike targets located in an adversary's sovereign territory. Additionally, adversary powers make claims of sovereignty that the United States has already refused to recognize, such as the Russian annexation of Crimea and the raised seabeds that China claims to bolster its claims to the nine-dash line. Regardless of the American political posture on these and similar territorial claims, adversary powers may view strikes against targets in such areas as an escalatory violation of sovereign territory.

These considerations can be addressed with three recommendations. First, each geographic combatant command (GCC) needs to define and describe the role of LRPF. Second, the United States needs to begin an aggressive information campaign, using both military and diplomatic resources, to describe the role of LRPF to Allies and adversaries. Third, the United States needs to continue to invest in air and missile defense (AMD) assets to improve survivability for friendly forces targeted in retaliatory strikes.

Each GCC is confronted by a unique problem set of adversary systems that could be engaged by multi-domain operations, land-based LRPF, or assets from across the Joint Services. The combatant command staff should identify those hostile systems that require the exquisite capabilities of LRPF for a successful kinetic strike prior to the transition from competition to crisis or conflict. Once these targets are identified, the staff must execute the necessary staff work to plan and deconflict the strike with supporting commands, partners, and Allies. This staff work is critical to ensure that a single target does not unnecessarily absorb finite resources. These staff actions must continue throughout the conflict continuum and through post-strike analysis to confirm sufficient effects on target.

The advent of LRPF requires a robust information campaign to inform Allies and adversaries of the capability. These messages should be carefully structured to indicate the ability to hold threat systems at risk. Messaging should be carefully structured and coordinated to appropriately communicate the ability to conduct conventional strikes against potentially sensitive targets. The careful management of these information operations may enable escalation management if a crisis or conflict develops.

Finally, LRPF assets will be inviting targets for hostile counterfire and must be prepared to either rapidly displace or be supplemented with AMD. The supplementation with additional AMD is particularly favorable because it increases the resources an adversary must invest to generate a credible threat.

In summary, the advent of LRPF provides the commander with an exquisite capability to penetrate and dis-integrate adversary A2/AD systems through conventional kinetic strikes. The unique capabilities of these systems magnifies familiar challenges – such as fires deconfliction, management of the competition continuum, protection – but these challenges are manageable, and are substantially eased through dedicated effort during the competition phase. ■

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As the Services modernize to implement the Joint Warfighting Concept, they will increasingly operate dispersed, across longer ranges, and using a greater number of autonomous platforms.

How might this evolution in the nature of warfare change the manner and likelihood of operational WMD employment?

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The 2022 National Defense Strategy introduces “integrated deterrence,” focusing on coordinated action among military services to maintain a status quo in global security.¹ The 2023 Joint Warfighting Concept (JWC) outlines how integrated deterrence is intended to be practiced, should armed conflict arise. Specifically, it outlines a modern vision for US defense focused on flexibility, emphasizing longer operational ranges and strike capabilities informed by superior information and communications. Warfare shifts from territorial objectives to targeting adversary military capabilities and leadership, with land forces potentially consolidating in rear areas and maritime forces spreading across broader geographies. Air assets prioritize global strike readiness, and technologies supporting information warfare are increasingly valued.

The JWC also considers the evolving context for the potential use of WMDs, particularly nuclear weapons. Modernized stockpiles, and nuclear command systems serve as deterrents against adversary actions globally, including NATO’s stance against Russian expansion in Europe and efforts in the Indo-Pacific to deter China’s ambitions along the first island chain.² Emphasis on “pulsed operations” supports conditions for offensive nuclear strikes against strategic targets, with maritime forces countering A2/AD defenses in support, and ground forces securing key assets in vulnerable locations. The US Air Force is most likely to operationalize nuclear weapons.

Russia and China’s nuclear doctrines suggest nuclear use to safeguard sovereignty or regime survival, with Taiwan and conflicts in the first island chain seen as critical vulnerabilities. Tactical nuclear use for battlefield effects is unlikely, reserved instead for strategic deterrence and assurance. Ukraine has been an important testing ground for competing theories. North Korea poses a wildcard threat, primarily focused

on regime survival. Advanced computing technology increases the risk of biological and chemical threats from rogue states, criminals, and terrorists.

Using this vision for future warfare as context, this essay takes a domain-based approach to addressing the WMD question. Two characteristics are emphasized: likelihood and manner of use.

Land Domain

The JWC, relevant to both the Army and Marine Corps, focuses on “pulsed operations” with long-range precision fires, integrated air and missile defense, and close combat forces.³ Army Chief of Staff Randy George envisions land-based forces enabling other joint force operations by creating time and space. This emphasizes conventional and air defense artillery, signal and electronic warfare, protected by traditional maneuver elements. Priority shifts from territorial to military and political targets. Marine Force Design 2030 similarly emphasizes a forward information gathering role. Focus on stand-in forces (SIF) and expeditionary advanced basing operations (EABO), underscore the Marines’ as a forward, light, reconnaissance-focused force.⁴ Neither service expects to resume nuclear capabilities.

The Ukraine conflict provides a live case-study on how nuclear weapons impact an ongoing land campaign. Since 2022, Russia has placed nuclear formations on high alert, tested advanced delivery systems, conducted public nuclear exercises, and engaged in nuclear saber-rattling. However, no nuclear devices have been deployed in the conflict. Recently, Putin reiterated readiness to use nuclear weapons if sovereignty is threatened, indicating that the Ukraine conflict will continue under a nuclear shadow for the foreseeable future.⁵

Maritime Domain

The Navy and Coast Guard are integral to the JWC, enhancing U.S. military capabilities across domains. The Navy focuses on sea superiority against adversaries like China and Russia, modernizing fleets with unmanned systems and advanced weapons. While the Army and Marines organize for longer operational reach, and concentrated forces with a protection imperative, the Navy is evolving towards a more distributed arrangement. Its “Distributed Maritime Operations” concept emphasizes expanding distance, leveraging deception, hardening defense, increasing distribution, ensuring delivery, and generating decision advantage.⁶ The Navy integrates cutting-edge technologies like unmanned underwater vehicles and upgraded acoustic sensors to maintain maritime standoff and mobility, supporting JWC’s information advantage and logistical resiliency.

China’s anti-access area denial strategy focuses on the “first island chain” with long-range precision fires and ballistic missiles, aiming to secure maritime claims.⁷ It is uncertain whether China retains a nuclear mission against coveted “sovereign” territory including Taiwan. This scenario offers the biggest risk to US interests.

Russia’s maritime nuclear capabilities, including a nuclear-powered/nuclear-tipped torpedo, extend its maritime targeting and influence in contested regions like the Arctic.⁸ Warship port calls to Cuba, Venezuela and Nicaragua likewise shift power dynamics in the Western Hemisphere.⁹ The Navy will play an outsized role in defending against these provocations.

Air and Space Domains

The Air Force’s Future Operating Concept aims to achieve “pulsed airpower” by exploiting temporary air superiority for tactical advantage through flexible and dominating response options. The Space Force, established recently, alleviates the burden on other services by managing critical information and communication networks in space.

The US nuclear deterrent is enhanced by modern delivery technology despite adversary defenses. The B-21 Raider, replacing older B-2 and B-52 variants, serves as a deep-strike option with both conventional and nuclear capabilities, predominantly supporting NATO assurance and European theater operations. Recent developments in hypersonic missiles by the US, Russia, and China offer high-speed air-defense

defeating capabilities with potential for penetrating strikes, featuring fast delivery, stealth capabilities, maneuverability, and dual-use warheads.¹⁰ With “fractional orbital” trajectory, these modern delivery systems promise to upend global security postures.

Conclusion

Looking ahead, nuclear arsenals will likely continue as strategic deterrents, less likely to be used for local or theater-level military objectives. Other ideations including low yield use as demolition munitions, axis of advance obstacle emplacement, or acts of terror are highly unlikely. Rather, chemical and biological threats are more poised to be leveraged for these ends, as the Syrian conflict has demonstrated. Like the 2023 return to the trenches in Europe, the future of WMDs in warfare may not be too radically different from that of the Cold War unless it turns hot. ■

Notes

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The 2023 DOD Countering Weapons of Mass Destruction (CWMD) Strategy requires the Department to “take action to deter WMD use and assure US Allies and partners.”

In a resource-constrained environment, what types of campaign activities are best-suited to deliver these effects for a Joint Force Commander?

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One of the most visual and kinetic campaign activities that can be implemented is the expansion of US training and exercises with multinational partners. Current multinational exercises lack any real focus on CWMD, resulting in a combined force which lacks the experience in operating in a contaminated environment, particularly in a conventional nuclear integration scenario. Combined exercises focused on maneuvering together in a nuclear operational environment sends strong messages of assurance to Allies and deterrence to adversaries. These activities, while effective in assuring Allies and deterring adversaries, certainly come with risk. Demonstration of combined capability could be potentially seen as escalatory behavior, leading to public and international scrutiny.

Another method of deterring WMD use is by exploiting the visibility and disposition of global US nuclear-capable assets. Expanded dual-capable aircraft (DCA) training, to include a rotation of NATO Allies, will establish confidence in the logistics, procedural, and operational mechanisms to support NATO employment of theater nuclear options. Extending DCA capabilities into USINDOPACOM may dissuade WMD use and reduce proliferation risks. Similarly, integrating naval forces from Japan and the Republic of Korea with US Demonstration and Shakedown Operations test launches reinforce US extended deterrence in the Indo-Pacific.¹ Lastly, reconfiguring an Intercontinental Ballistic Missile (ICBM) with a multiple independently targetable reentry vehicle payload during a regularly scheduled Glory Trip, a USAF readiness exercise, will demonstrate the ability of the US to maintain a flexible first-strike capability in the face of New START expiration and the fielding of Sentinel ICBMs.² Each of these options may be perceived as escalatory by other nations, and should be widely coordinated national-level decisions.

The US could also pursue three specific capabilities to further nuclear deterrence and allied assurance. The first is the ability to respond to tactical nuclear strikes with non-nuclear munitions and achieve a “matched” response in terms of effect, demonstrating that the US can achieve national objectives without having to resort to nuclear means. The second capability is an interconnected system to display and communicate known or suspected Chemical, Biological, Radiological, and Nuclear (CBRN) threats to NATO and non-NATO Allies. Sharing threat information quickly and efficiently is critical to WMD deterrence on a global scale. Finally, the Department requires the ability to train conventional units to overcome CBRN effects they may experience on the battlefield. Integrating WMD effects into training demonstrates resilience and assures Allies.

Information operations (IO) will also play a critical piece during competition, bringing together highlights from the other campaigning activities to both deter threats and reassure partnered forces. Themes and messages from the strategic to the tactical level should demonstrate US ability to fight and win in the harshest environments. The 2023 DoD Strategy for Operations in the Information Environment lays out a framework to enable Joint Force Commander (JFC) to integrate messaging with the Department and the interagency.³ Within the JFC’s staff, IO working groups that consist of Civil Affairs, Public Affairs, Cyber Operations, IO, Joint Electromagnetic Spectrum Operations, Operations Security, and Space Operations should integrate CNI messaging across all domains as outlined in JP 3-04 *Information in Joint Operations* and ADP 3-13 *Information*.

The JFC must be also be able to adjust, adapt, and leverage outside resources to accomplish CWMD missions within their theater. Military leadership

must understand the capabilities and capacities of agencies, organizations, and committees who have a commensurate role in the CWMD mission. The JFC may then leverage these organizations—such as the Defense Threat Reduction Agency (DTRA), the Army’s 20th Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) Command, and the counterproliferation organizations within the Department of State—to augment unit preparedness and project a more robust deterrent posture. All three of these organizations can provide training and equipment to US military and foreign partners to close capability gaps and build a resilient combined force. ■

Notes

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What type of approach should the Joint Force take toward integrating nuclear operational considerations into tactical training, theater-level exercises, and PME?

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Introduction

The future battlefield is increasingly characterized by nuclear-armed adversaries who “seek to leverage WMD to influence and constrain the United States across the spectrum of conflict.”¹ To compete and win in this environment, the Army, as part of a joint and combined force, must be able to deny adversaries any perceived benefit from threat of or employment of nuclear weapons, by demonstrating readiness to fight and win if a nuclear weapon is employed. The Army will need to train and educate its Soldiers and leaders on multiple levels—from the policy implications of nuclear employment and procurement, to the tactical realities of maneuvering on a nuclear battlefield.

Professional Military Education

In Professional Military Education (PME), Army leaders need additional exposure to operations on a nuclear battlefield. While it would be simple to add additional instruction to cover nuclear operations, (though at the expense of some other topic), this fails address the actual problem: the lack of integration between conventional and nuclear capabilities. The focus should be on providing leaders the critical information required to understand how their formations are directly impacted by nuclear weapons, and what measures they need to take (dose monitoring, protective measures, triage) to continue operations. Armed with this information, PME developers should seek to incorporate nuclear conditions into already existing academic exercises, rather than conduct nuclear education in isolation. Future company commanders would be better served by incorporating limited nuclear planning into their exercises, rather than receiving a 1-2 hour block of instruction before moving on to the next topic.

Large-scale Exercises

Army leaders have, so far, been reluctant to conduct large-scale exercises involving the simulated use of

nuclear weapons. Their concerns include the fear that nuclear inclusion within an exercise, absent well-crafted public affairs messaging, will cause more tension with potential adversaries than it will gain in training value. While this concern is rational, Russia certainly is not deterred by the same considerations.² A second, though unstated reason to avoid integrating nuclear effects into exercises is the risk of exposing a lack of preparedness. that might embolden potential adversaries. It is unlikely, however, that that adversaries are completely ignorant of the gaps in U.S. capabilities. Many live training events are relatively easily observed and gaps can be inferred simply by noting what is obviously absent from the training environment. The Army should set conditions to better integrate nuclear effects into training by preparing leaders to plan and direct the activities of small units on a nuclear battlefield, collectively training units to operate in proximity to nuclear effects, and by clearly messaging to partners and adversaries that nuclear training, even at the tactical level, promotes deterrence and decreases the likelihood of nuclear employment.

Unit-Level Training

Numerous Army studies have highlighted the disjointed nature of CBRN training at the unit-level, where leaders either see the cost of training as outweighing its benefits or they conflate training against a single CBRN modality as sufficient preparation for all WMD environments. Yet the tactics, techniques, and procedures required to fight in a chemical or biologically degraded environment differ greatly from that of the nuclear battlefield. Leaders should find ways based on their experiences at institutional training to incorporate elements of the nuclear battlefield into everyday training. At unit level, this could include use of radiation monitoring equipment to characterize the battlefield and battle staff tailoring of maneuver plans in response to STRIKWARNs or survey reports.

Building Readiness

The Army must find ways to educate units on best-practices outside of the institutional training cycle. One way to do this is through the Army Campaign Plan's focus on building CBRN readiness—a “seven-year plan to increase lethality, survivability, and readiness of maneuver formations to deter WMD use and, if necessary, operate in a CBRN environment during large scale combat operations.”³ While this initiative is attempting to training large units on a variety of CBRN related tasks over a long period of time, a more responsive method might use Mobile Training Teams composed of experts from the U.S. Army Nuclear and Countering-WMD Agency (USANCA) or DTRA to train squad through battalion-level leaders on what tasks to prioritize, and how to best replicate the nuclear battlefield during training.

Recommendations

Ultimately, none of these solutions can be successful in isolation: Successful exercises require trained Soldiers; successful training requires educated leaders; and educated leaders require the motivation and prioritization generated by exercises. Common to all three is the idea that to be successful, the Army does not require more nuclear training, but requires that nuclear training be better integrated into the training that is already being conducted. To this end, we recommend that the Army take the following steps to prepare to operate on a nuclear battlefield:

1. Development of an Army strategy to set conditions for integration of nuclear effects into exercises.
2. Incorporation of echelon-appropriate nuclear planning into PME courses.
3. Preparation at the unit for future Combined Training Center-level exercises involving simulated tactical nuclear employment.
4. Integration of small unit nuclear tasks (detection, mitigation, triage) into unit training cycles—-independent of training for operation in chemically or biologically degraded environment.
5. Deployment of Mobile Training Teams to train small-unit leaders on what operations in a nuclear environment will actually look like and how to best train for them.

Conclusion

The Army must prioritize operations in a nuclear environment within Professional Military Education for both officer and enlisted personnel, within unit-level training, and within Army and joint exercises. By making small changes to integrate nuclear considerations across PME, small unit training, and collective exercises, the Army ensure that it deters our nation's potential adversaries, and if deterrence fails, is able to fight and win our nation's wars.

Notes

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