

CONVENTIONAL-NUCLEAR INTEGRATION:

Cold War Lessons for Today's Warfighter



FINAL REPORT, January 2025

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FOREWORD

The return of strategic competition among the major powers has brought with it a renewed emphasis on nuclear weapons. China and Russia seek to degrade established international norms while rapidly expanding and modernizing their nuclear forces, diversifying advanced conventional systems, and developing chemical, biological, radiological, and nuclear (CBRN) capabilities designed to exploit U.S. and allied vulnerabilities. North Korea continues to expand its nuclear weapon program, while Iran could produce weapons-grade uranium quickly should it choose to do so. Given this dynamic and evolving threat environment, the United States must be ready for near-simultaneous conflict with multiple nuclear-armed adversaries. The Department of Defense (DoD) must plan, train, and exercise nuclear and non-nuclear forces to operate in, around, and through a nuclear environment – often referred to as conventional-nuclear integration (CNI).

CNI is not a new concept. From the 1950s to the 1980s, the U.S. military achieved high degrees of CNI to meet the demands of the Cold War. When the Soviet Union collapsed, far less attention was paid to CNI by the U.S. military. Reversing decades of atrophy to meet the new threat environment means breaking down stovepipes between conventional and nuclear planning across the DoD.

To that end, the Defense Threat Reduction Agency (DTRA) is postured to meet the demands of this security environment and is committed to providing support and resources to address the CNI problem set. Our strategic priorities are to *Deter* strategic attack against the United States and our allies; *Prevent*, reduce, and counter weapons of mass destruction (WMD) and emerging threats; and *Prevail* against WMD-armed adversaries in crisis and conflict. We are preparing for and responding to the current and emerging WMD threats that pose the greatest risk to our nation. We have partnered with the Joint Force, combatant commands, and interagency to provide education and training, subject matter expertise for planning support, nuclear effects modeling and analysis, and exercise support.

This monograph is an example of how DTRA is contributing. It provides the warfighter a means of understanding how nuclear and conventional forces were synchronized in the past, the lessons learned, and how to adapt them to today's strategic competition. I invite all who read it to consider the implications so that the Joint Force can exploit its resiliency advantage, dominate operations in, around, and through a nuclear environment, and execute planning and employment operations. I have faith that if we work together, there will be no question of our ability to *Deter, Prevent, and Prevail*.

A handwritten signature in black ink, appearing to read "Rebecca K.C. Hersman", with a long, sweeping horizontal line extending to the right.

Rebecca K.C. Hersman

Former Director (2022 – 2025)

Defense Threat Reduction Agency

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LIST OF ACRONYMS

AAF	 Army Air Forces
AAW	 Anti-Air Warfare
ACT	 Allied Command Transformation
ADM	 Atomic Demolition Munition
ADP	 Automatic Data Processing
AEC	 Atomic Energy Commission
AFAP	 Artillery-Fired Atomic Projectile
AFM	 Air Force Manual
AFSWP	 Armed Forces Special Weapons Project
AMC	 Air Materiel Command
APC	 Armored Personnel Carrier
ARDC	 Air Research and Development Command
ARTEP	 Army Training and Evaluation Program
ASROC	 Anti-submarine Rocket
ASW	 Anti-submarine Warfare
ATBM	 Anti-Tactical Ballistic Missile
ATFA	 Atomic Field Army
BMD	 Ballistic Missile Defense
BRAAT	 Base Recovery After Attack
BTF	 Bomber Task Force
CAS	 Close Air Support
CASF	 Composite Air Strike Force
CBRN	 Chemical, Biological, Radiological, Nuclear

CEP	Circular Error Probable
CFE	Conventional Forces in Europe
CGSC	Command and General Staff College
CINCLANTFLT	Commander in Chief, Atlantic Fleet
CINCPAC	Commander in Chief, Pacific Fleet
CINCSAC	Command in Chief, Strategic Air Command
CINCUSAFE	Command in Chief, U.S. Air Force, Europe
CINCUSEUCOM	Commander in Chief, U.S. European Command
CINCUSNAVEUR	Commander in Chief, U.S. Naval Forces, Europe
CJCS	Chairman of the Joint Chiefs of Staff
CNA	Center for Naval Analyses
CNO	Chief of Naval Operations
CONARC	Continental Army Command
CONUS	Continental United States
CSAF	Chief of Staff of the Air Force
CSS	Combat Service Support
DCA	Dual-Capable Aircraft
DEFCON	Defense Readiness Condition
DOD	Department of Defense
EAM	Emergency Action Message
ECM	Electronic Counter-measures
EMP	Electro-Magnetic Pulse
ERW	Enhanced Radiation Weapon
EW	Electronic Warfare
FAS	Field Artillery School

FM.....Field Manual

GLCM.....Ground-Launched Cruise Missile

GS.....General Support

GSPGeneral Strike Plan

ICBMInter-Continental Ballistic Missile

INF.....Intermediate-Range Nuclear Forces

IRBMIntermediate-Range Ballistic Missile

ISRIntelligence, Surveillance, Reconnaissance

IVSNInitial Voice Switched Network

JCSJoint Chiefs of Staff

JPME.....Joint Professional Military Education

J-SEI.....Joint-Second Echelon Interdiction

LCC.....Launch Control Center

LRTNFLong-Range Theater Nuclear Forces

MACVMilitary Assistance Command, Vietnam

MOS.....Mission Occupation Specialty

NATO.....North Atlantic Treaty Organization

NBCNuclear-biological-chemical

NC3.....Nuclear command, control, and communications

NCANational Command Authority

NDSNational Defense Strategy

NFPG.....Nuclear and Fire Planning Group

NFUNo First-Use

NNLNon-Nuclear Lance

NORTHAG....Northern Army Group

NPG Nuclear Planning Group
NPR Nuclear Posture Review
NRAS Nuclear Release Authentication System
NRF Nuclear Reserve Force
NSC National Security Council
NSI Nuclear Surety Inspection
NSNW Non-Strategic Nuclear Weapon/Warhead
NTP Naval Training Plan
NUDORE Nuclear Doctrine, Organization, and Equipment
NWEC Nuclear Weapons Employment Course
NWEO Nuclear Weapons Employment Officer
OMG Operational Maneuver Group
OSD Office of the Secretary of Defense
O&M Operations and Maintenance
PENTANA Penta-Atomic-Non-Atomic
PNi Presidential Nuclear Initiative
PNL Prescribed Nuclear Load
QRA Quick Reaction Alert
RAF Royal Air Force
ROAD Reorganization Objective Army Division
SAC Strategic Air Command
SACEUR Supreme Allied Commander Europe
SACLANT Supreme Allied Commander Atlantic
SAM Surface-to-Air Missile
SCARS SACEUR Control Alerting and Reporting System

SEA	Southeast Asia
SHAPE	Supreme Headquarters, Allied Powers Europe
SIOP	Single Integrated Operational Plan
SLBM	Submarine-Launched Ballistic Missile
SLCM	Sea-Launched Cruise Missile
SLCM-N	Sea-Launched Cruise Missile-Nuclear
SNOWCAT	Support of Nuclear Operations with Conventional Air Tactics
SPO	Special Projects Office
SRBM	Short-Range Ballistic Missile
SSBN	Sub-Surface Ballistic Nuclear
SSG	Strategic Studies Group
STAC	Strategic-Tactical Air Command
STRIKFORSOUTH	Striking Force South
SUBROC	Submarine-Launched Rocket
TAAF	Tactical Atomic Air Force
TAC	Tactical Air Command
TARE	Telegraph Automatic Relay Equipment
TLAM/N	Tomahawk Land Attack Missile/Nuclear
TNF	Theater Nuclear Forces
TPI	Technical Proficiency Inspection
TPNW	Treaty on the Prohibition of Nuclear Weapons
TRADOC	Training and Doctrine Command (U.S. Army)
USA	U.S. Army
USAF	U.S. Air Force

USAFE U.S. Air Forces in Europe
USANCA..... U.S. Army Nuclear and Chemical Agency
USAREUR U.S. Army Europe
USCINCEUR..... U.S. Commander in Chief Europe
USEUCOM..... U.S. European Command
USN..... U.S. Navy
USSOCOM..... U.S. Special Operations Command
WDD Western Development District
WSEG Weapon Systems Evaluation Group

EXECUTIVE SUMMARY

- With our adversaries increasing the importance of nuclear weapons in their military strategies, the 2022 U.S. National Defense Strategy (NDS) and Nuclear Posture Review (NPR) have issued a call to action: "We will bolster regional nuclear deterrence by enhanced consultation with Allies and partners and by better synchronizing conventional and nuclear aspects of planning...."¹ We must be prepared, defensively and offensively, for limited nuclear use by an adversary in a regional conflict.
- Improving nuclear-conventional synchronization is a complex challenge, but looking at the U.S. and Soviet approaches to synchronization during the Cold War – to include their accomplishments, missteps, and remaining gaps – offers important lessons learned for today's warfighter.
- Applying these lessons entails understanding how the current security environment is similar and dissimilar to the Cold War at the strategic and operational levels.
- At the strategic level, the following features of Cold War nuclear-conventional synchronization *still apply*:
 - ***Russia continues to seek advantage by exploiting perceived gaps in the spectrum of deterrence.*** It is the same dynamic that drove the United States to deploy new intermediate-range missiles in the early 1980s and a low-yield submarine-launched ballistic missile in 2020.
 - ***The North Atlantic Treaty Organization (NATO) still needs U.S. nuclear weapons in theater, Alliance consultation on their posture and employment, and resilient nuclear command, control, and communications (NC3).*** As NATO takes up nuclear-conventional integration anew, its nuclear and non-nuclear stovepipes will need to be linked in some fashion, perhaps through an ad hoc committee.
 - ***Our European allies remain concerned about nuclear warfighting.*** While allied publics are showing greater support for nuclear deterrence following the 2022 Russian invasion of Ukraine, they remain concerned about the risk of nuclear escalation in the conflict. The notion of integrated nuclear and conventional operations by NATO is seen in some European quarters as making nuclear use more likely.

¹ 2022 National Defense Strategy of the United States of America, U.S. Department of Defense, 9-10

- ◉ ***Anxiety over nuclear war still factors in European domestic politics.*** U.S. and NATO public communications about their nuclear exercises must avoid mistakes of the 1950s and anticipate efforts by disarmament activists and Russia to mischaracterize NATO nuclear-conventional synchronization as “lowering the nuclear threshold.”
- At the operational level, the following nuclear-conventional synchronization features still apply:
 - ◉ ***NATO and Russia retain dual-capable weaponry in theater.*** NATO has maintained uninterrupted since the 1950s the ability to conduct conventional or nuclear missions with land-based tactical aircraft (i.e., dual-capable aircraft or DCA). Russia likewise has retained DCA but, in contrast to NATO, also kept and enhanced its ground- and sea-based options for delivering conventional or nuclear weapons.
 - ◉ ***The transition from conventional to theater nuclear operations could occur rapidly.*** While Russia can introduce nuclear weapons promptly into an ongoing conventional conflict, NATO conventional and nuclear planning remains artificially segregated, potentially slowing the ability to send important deterrence signals and/or generate potential Alliance nuclear response options.
 - ◉ ***The survivability of NATO theater nuclear forces remains critical.*** As NATO’s theater nuclear force has shrunk since the end of the Cold War, the survivability of individual weapons and delivery platforms has taken on added importance. NATO appears cognizant of this risk and is giving more attention to DCA survivability. Deeper study may be required by today’s warfighter to address NATO theater nuclear survivability in the face of emerging technologies.
 - ◉ ***Nuclear awareness among U.S. and Allied forces remains low.*** Because of institutional de-emphasis, nuclear education among today’s warfighters is no better than in the 1950s, which means the implications of nuclear employment are probably neglected in planning and training at the tactical level, and conventional-nuclear synergies remain unrealized.
 - ◉ ***Conventional and nuclear forces are still complementary.*** The nuclear umbrella crucially enables the United States and its Allies to mass conventional forces and leverage their technological advantages for a counter-attack.
- At the strategic level, nuclear-conventional synchronization *differs* from that during the Cold War in that:

- ◉ ***The United States will need to deter two major nuclear powers simultaneously.*** This added complexity is compounded by the head start Russia and China have in the synchronization of nuclear and non-nuclear forces.
- ◉ ***NATO's membership has doubled since the end of the Cold War.*** An Alliance consensus on nuclear-conventional synchronization does not exist and will take time to build.
- ◉ ***Our Indo-Pacific Allies want greater participation in the nuclear mission.*** Japan, Australia, and South Korea seek more robust and active roles and responsibilities in operationalizing deterrence.
- ◉ ***Escalation is more complex and non-linear.*** Cross-domain war games should be conducted to identify ways and means to limit undesirable escalation, exploit escalation when necessary or unavoidable, and generally improve adaptive planning skills.
- ◉ ***Co-mingled warning and command and control systems could undermine nuclear stability.*** We need to understand how attacks against co-mingled command and control systems might inadvertently lead us or an adversary to escalate and to identify mitigation measures.
- ◉ ***The legitimacy of U.S. nuclear command and control may be at risk due to adversary information operations.*** The military and public at large may have to be reassured of the integrity and legitimacy of the U.S./NATO nuclear chain of command in the face of social media-fueled conspiracy theories instigated by our adversaries.
- ◉ ***The Russian threshold for theater nuclear use is lowering.*** Russia increasingly relies on its non-strategic nuclear weapons (NSNW) to compensate for perceived conventional weaknesses, while retaining such a numerical advantage in NSNWs that NATO could see little sense in escalating.
- ◉ ***NATO use of nuclear weapons is increasingly remote.*** It must be impressed upon political leaders that it is the balance of conventional force resiliency and the prospect of a limited nuclear response that will best deter Russian use of nuclear weapons in a theater conflict.
- At the operational level, nuclear-conventional integration ***differs*** from that during the Cold War in that:

- ◉ ***NATO's theater nuclear capability, unlike Russia's, lacks diversity.***
The Alliance simply presents the adversary with less planning dilemmas in terms of in-theater nuclear forces. It is prudent to ask whether NATO still has sufficient nuclear options at its disposal and whether the space and cyber domains might be able to deliver “nuclear-like” effects on the adversary.
- ◉ ***NATO DCA readiness is low compared to that during the Cold War.*** In light of the ongoing conflict in Ukraine and President Putin's nuclear threats, NATO needs to reassess DCA readiness against the new demands of rapid and non-linear escalation.
- ◉ ***NATO now has a ballistic missile defense (BMD) capability.***
Adaptation of NATO BMD could contribute additional non-nuclear means with which to deter and defend against limited Russian nuclear use.
- ◉ ***More capabilities and domains mean greater integration complexity but more synergy/substitution potential.*** Despite the challenges, expanding and integrating the strategic toolkit might generate new options to manage escalation and achieve decisive operational effects.
- ◉ ***There is greater acceptance of “Jointness.”*** The Joint Staff, combatant commanders, and the services' senior leaders have a new appreciation of the importance of synchronization. It is critical to sustain this new thinking and inculcate it into subordinate levels of command.
- ***To operationalize*** nuclear-conventional synchronization as called for by the NDS and NPR we must:
 - ◉ ***Leverage Cold War thought leadership.*** We do not need to reinvent the wheel; a number of Cold War-era works used in this study are particularly relevant to today's synchronization challenges.
 - ◉ ***Apply the best intellectual resources.*** We should identify and apply top talent to synchronization-related initiatives, pulling in a balanced fashion from the Joint Professional Military Education community, contractors, think tanks, and academia.
 - ◉ ***Establish a joint and allied framework for synchronization.*** The U.S. military must demonstrate synchronization leadership and commitment and bring our allies and partners along, as called for in the NDS and NPR. This entails assessment of nuclear threats at the theater level and of our current ability to deal with them through a variety of means, development of a forward-looking synchronization concept, and its migration to joint and allied doctrine.

- ◉ ***From the outset, factor in a public communications strategy.*** A major challenge will be trying to improve the coherence of Alliance nuclear and non-nuclear forces without being seen as “copying” Russian doctrine. An effective public communications strategy for NATO entails emphasizing what synchronization is not.
- ◉ ***Raise awareness of chemical-biological-radiological-nuclear (CBRN) threats across the Joint and Allied Force.*** Reliance on specialist cadres during (and after) the Cold War had the undesirable effect of discouraging the rank and file from taking CBRN threats seriously. To avoid this pattern, more innovative approaches will be needed to build CBRN awareness across the force.
- ◉ ***Anticipate the demands of sustained conventional operations on the nuclear mission and vice versa.*** The Department of Defense (DOD) should take a fresh look at the demands of past conventional operations on dual-capable fighters and bombers, such as B-52 operations during Vietnam, as part of broader efforts to “stress test” potential competing nuclear-conventional demands on aircraft such as the B-21. Likewise, pro-longed periods of nuclear alert (e.g., due to adversary nuclear threats) could put stress on the dual-capable (e.g., F-35) and conventional forces supporting nuclear missions, reducing their availability for non-nuclear operations.
- ◉ ***Conduct synchronization net assessments.*** The ability of U.S./Allied, Russian, Chinese, and North Korean forces to function in a nuclear environment needs to be re-assessed systematically, informed by lessons learned from Russian military performance in the war against Ukraine.
- ◉ ***Propose practical measures to redress synchronization shortfalls.*** To avoid a sense of defeatism, we should aim to achieve nuclear and non-nuclear synchronization incrementally across a range of actions, from education and training initiatives, adaptations to plans, new or different exercises, and other steps.
- ◉ ***Plan for a synchronization learning curve.*** During the Cold War, there was a lag of 18 to 24 months for our European allies to digest new U.S. military concepts and adapt them to their own domestic political requirements. With the war in Ukraine, the time is ripe to engage our NATO allies more deeply on synchronization, recognizing an inevitable learning curve while also aiming to compress it where possible through sustained dialogue at all levels.

- ◉ ***Continue to build on the accomplishments of the U.S. military and NATO.*** Even absent an agreed definition of nuclear-conventional integration or synchronization, the services, commands, and other DOD components are moving ahead in their thinking about the subject. In June 2022, NATO committed “to having the military capabilities to operate effectively and fight and prevail in any environment.” These are important shifts in mindsets but they lack coordination; before long these disparate efforts need to be woven together into true Joint and Allied concepts, doctrines, and programs.

INTRODUCTION

In the aftermath of the Cold War, the United States enjoyed unmatched conventional superiority. Nuclear weapons were viewed in the West as increasingly irrelevant for all but a handful of unlikely scenarios. As such, the relationship between nuclear and non-nuclear forces changed dramatically, resulting in further separation between the two in planning, training, and exercising at the theater level. Today, however, America's ability to fight and win wars on a strictly conventional basis is increasingly under threat. China, Russia, and North Korea are modernizing and diversifying their ability to threaten or employ nuclear weapons in a regional conflict deliberately blurring the line between conventional conflict and nuclear coercion to offset U.S. conventional strength and achieve their aggressive aims.

The nuclear threats faced by the United States and its Allies and partners are unlikely to diminish anytime soon. Russian President Vladimir Putin has repeatedly threatened to use nuclear weapons to keep the United States and NATO from directly intervening in his unprovoked war of aggression against Ukraine. Russia's doctrine and strategy reportedly rely heavily on nuclear weapons for intimidation, coercion, and potentially, warfighting. Military setbacks following Russia's February 2022 invasion have raised concerns that Moscow, consistent with this doctrine, might try to escalate its way out of failed aggression by employing nuclear weapons. China is now embarked on a rapid, sustained, and expansive build-up of nuclear forces in a quest to attain rough parity with the United States by the 2030s. This includes modernized and increasingly diverse nuclear forces suitable for limited, regional employment. North Korea is committed to a major expansion of its nuclear forces, to include the tactical variety, and may seek to resume nuclear testing. Pyongyang regularly engages in provocative nuclear threats aimed at South Korea, Japan, and the United States.

This new wave of nuclear saliency brings with it dynamic interactions between nuclear and non-nuclear forces, presenting Western warfighter and policymakers with complex challenges not seen since the Cold War. Our current lack of preparedness to function on a nuclear battlefield may well invite adversary nuclear attack on our troops during a regional conflict. Conversely, perceived U.S. conventional advantage is likely

to exacerbate perceived pressures on our adversaries to use or employ nuclear weapons to avoid defeat. Certain U.S. conventional military operations against a nuclear-armed opponent may also carry high risk of unintentionally triggering nuclear use by that enemy. These complexities suggest that our own nuclear and non-nuclear forces must be better integrated as part of a mutually reinforcing strategy to deter aggression and achieve U.S. objectives in a regional war.¹ Indeed, nuclear weapons will underpin any crisis or conflict with a nuclear-armed opponent – planning for a purely “conventional” conflict is no longer an option. This realization is clearly stated in the 2022 U.S. National Defense Strategy (NDS):

We will bolster regional deterrence by enhanced consultation with Allies and partners and by better synchronizing conventional and nuclear aspects of planning – including by improving conventional forces’ ability to operate in the face of limited nuclear, chemical, and biological attacks so as to deny adversaries benefit from possessing and employing such weapons.²

The 2022 Nuclear Posture Review (NPR) offers further detail:

Another important element of integrated deterrence is better synchronizing nuclear and non-nuclear planning, exercise, and operations. Our goal is to strengthen deterrence and raise the nuclear threshold of our potential adversaries in regional conflict by undermining adversary confidence in strategies for limited war that rely on the threat of nuclear escalation. When engaged in conventional operations against a nuclear-armed adversary, the Joint Force must be able to survive, maintain cohesion, and continue to operate in the face of limited nuclear attacks. This form of resilience sends a distinct deterrence message to an adversary – that limited nuclear escalation will not render U.S., Allied, and partner forces incapable of achieving our warfighting aims. It is

¹ Gregory Giles, "Conventional-Nuclear Integration: Avoiding Misconceptions and Mistakes," War on the Rocks, August 10, 2021, <https://warontherocks.com/2021/08/conventional-nuclear-integration-avoiding-misconceptions-and-mistakes/>.

² 2022 *National Defense Strategy of the United States of America*, Department of Defense, 9-10.

also critically important that the Joint Force can fight and win in a chemical, biological, radiological, and nuclear (CBRN)-contaminated environment. Further development of plans and force requirements to enable operations in a nuclear environment will be a focus of NPR implementation, including requirements to ensure the resilience of conventional systems to limited nuclear use effects and enhanced mission assurance of space assets critical to conventional force operations.³

Yet, when it comes to nuclear-conventional integration, there are three schools of thought. One is that “we have been here before” and should just replicate what the United States did during the Cold War. A second view is that Cold War thinking is, by definition anachronistic. We should start with a clean slate. A third school contends that any attempt to better synchronize U.S. nuclear and non-nuclear forces “lowers the nuclear threshold” or embraces “nuclear warfighting. This school insists on keeping nuclear weapons separated from other military capabilities and planning.

With these threats, official guidance, and schools of thought in mind, this report explains how nuclear forces were integrated militarily and synchronized with conventional weapons by the United States and the Soviet Union during the Cold War and how our warfighter can apply the lessons learned to meet today’s challenges.⁴ What we have found is that none of the aforementioned schools of thought by themselves is satisfactory. U.S. nuclear-conventional integration during the Cold War yielded important accomplishments, as well as cautionary tales and unresolved gaps. To ignore this extensive body of experience would force today’s warfighter needlessly to “reinvent the wheel” and/or repeat past mistakes. Similarly, not to understand Soviet Cold War nuclear-

³ 2022 *Nuclear Posture Review*, Department of Defense, 10.

⁴ We refer to integration as the process by which the military distributed nuclear weapons to its general-purpose forces – army divisions, tactical air wings, major surface combatants and attack submarines – rather than the canonical strategic nuclear triad. We refer to synchronization as the process by which the military sought to align nuclear and conventional weapons into a cohesive approach to theater-level combat, principally in Europe. Some refer to this as “conventional-nuclear integration” or CNI, whereas the 2022 NPR speaks of “synchronizing nuclear and non-nuclear planning.” We thus adopt the term nuclear-conventional synchronization or simply synchronization to span these concepts.

conventional integration is to miss the bigger picture – and practical insights – regarding the current Russian threat of nuclear use, to include potentially limited employment concepts. As the 2022 NPR makes clear, synchronization is about *raising* the threshold of nuclear use by denying the adversary its hoped-for benefits. The 2022 NPR also talks about the “lack of collective experience and potential limited understanding of the interplay between nuclear and non-nuclear strategic capabilities in shaping a crisis or conflict.”⁵ We firmly believe this study helps address those shortfalls

Our overall approach is to use history as a guide for today’s warfighte . We have delved into U.S. and NATO archives and drawn upon declassified and translated Soviet and Warsaw Pact military documents and interviews. We also have included insights gleaned from important journal articles, books, and contractor studies of the time. At the same time, we have carefully noted the limits of historical analysis, advising the reader that the Cold War history of nuclear-conventional integration is not predictive, but rather suggestive to the extent that certain mindsets and patterns of behavior endure. Adapting those insights to changes in the security environment is essential.

As this study was performed during the COVID pandemic, we could not physically visit the various archives and so had to rely on what was available on-line (which was substantial). We readily acknowledge the resulting limitations; inevitably, there are key documents we missed. We made no effort to review classified materials for this study. Indeed, we saw value in keeping it unclassified to reach the widest possible audience and to stimulate discussion. Therefore, we do not claim to offer a definitive account of how the United States, NATO, the Soviet Union, and the Warsaw Pact handled nuclear-conventional integration and synchronization during the Cold War. We are nonetheless confident that in reviewing over 500 authoritative sources we provide the reader a reliable accounting of the subject. Further, we hope this study will encourage others, particularly U.S. service members – most of whom were born after the Cold War ended – to delve deeper into the archives and source material, engage critically, and bring the nuclear-conventional synchronization picture into sharper focus still.

⁵ 2022 *Nuclear Posture Review*, 10.

The study is organized into six chapters. Because the U.S. military lacked a strong joint perspective and approach for most of the Cold War, we found it necessary to devote individual chapters to each of the armed services, as they were largely on their own to integrate and synchronize nuclear and conventional weapons as each saw fit⁶ The fourth chapter is devoted to the Soviet military's approach to nuclear-conventional synchronization. The first four chapters feature text boxes that either alert the reader to an important lesson learned that will be recapped at the end of a given chapter or point out an important Cold War-era publication that is particularly germane to today's synchronization complexities. The fifth chapter compares the U.S. and Soviet approaches to synchronization, revealing a number of similarities and dissimilarities, as well as implications for today's warfighting. The final chapter applies historical insights from the preceding chapters to current synchronization challenges. It makes clear what is still relevant from the Cold War and what has changed. It then offers the warfighting practical, historically informed recommendations for taking forward synchronization today, as directed by the NDS and the NPR. While the analysis is focused on Russia and the European theater, the study's insights also lend themselves to the threats posed by China and North Korea in the Indo-Pacific theater.

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⁶ We did not profile the nuclear-conventional synchronization of the Marine Corps, which to a considerable extent followed Army practices during the Cold War.

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CHAPTER ONE: The U.S. Army's Approach to the Synchronization of Nuclear and Conventional Weapons During the Cold War

During the Cold War, what did the synchronization of nuclear and conventional weapons mean for the U.S. Army in terms of motivation, organization, doctrine, force posture, and training? The answers vary over time. Four phases of nuclear-conventional synchronization, with some degree of overlap, can be identified

1. Contemplating the atomic and missile age (late 1940s-mid 1950s)
2. Restructuring for dual capability and limited wars (late 1950s-early 1960s)
3. Reducing emphasis on increasing numbers of nuclear weapons (mid 1960s-mid 1970s)
4. Unresolved doctrine, end of nuclear mission (late 1970s-early 1990s).

Across these phases, what did the Army manage to accomplish in terms of nuclear and conventional synchronization? What gaps remained as the Cold War ended?

1. Contemplating the Atomic and Missile Age (Late 1940s-Mid 1950s)

The initial phase of Army nuclear and conventional synchronization spans the first fifteen years of the Cold War. It begins with the Army at peak power as World War II ends, only to be quickly marginalized as political leaders adopt atomic weapons as a cost-effective alternative to large, standing conventional forces. The phase marks the Army's quest to regain its stature by investing in atomic and missile technologies. During this time, Army theorists speculated on how ground forces ought to adapt to the use of nuclear weapons on the battlefield. The phase ends with the Army's first official doctrine on the tactical use of atomic weapons and studies suggesting how to reorganize for an integrated conventional-nuclear battlefield.

As noted in the pages of *Field Artillery Bulletin*, "When World War II ended the Army was by far the most important U.S. armed service. Not only did it have more than 8 million men under arms, it had sole control

over the production and deployment of nuclear weapons,”¹ as well as direct access to the captured German scientists who had developed the V2 rocket. Yet, the Army’s fortunes would quickly change.

As in its previous wars, the United States rapidly demobilized its military, drastically reducing manpower across the services. In December 1946, the Army’s Manhattan Project to develop atomic bombs was turned over to the civilian Atomic Energy Commission (AEC). In 1947, the Army Air Forces (AAF) achieved independence, becoming the U.S. Air Force. The AAF’s B-29 bombers, the only aircraft capable of delivering atomic bombs at the time, were turned over to the Air Force, along with the rest of the AAF’s combat aircraft. In the ensuing battle over service roles and missions, the Key West agreement hammered out by Secretary of Defense James Forrestal in 1948 assigned the Air Force responsibility for strategic (i.e., atomic) air warfare and granted the fledgling service the lead role in defending the homeland against air attack. For its part, the Army retained a role in local air defense of key installations. With the Truman and Eisenhower Administrations’ emphasis on the atomic bomber offensive, the Air Force’s share of the budget significantly increased – at the direct expense of the Army (and Navy).

Despite his own career in the Army, Dwight Eisenhower thought the atomic bomb made ground forces largely obsolete. In the atomic age, he envisioned the Army largely as a national guard, deployed at home to help keep order after the United States and the Soviet Union exchanged devastating nuclear blows.² In July 1956, Admiral Arthur Radford, Chairman of the Joint Chiefs of Staff (CJCS), tabled a plan to withdraw the Army’s combat divisions from Europe. “In their stead,” Radford argued, “small atomic task forces and European conventional forces could achieve the same deterrence effect as currently did deployed [U.S. Army] forces.... The limited-war mission was to be carried out by the air force, the navy, and a smaller Marine Corps. All were to be armed with nuclear weapons. Army strength was to decline significantly, and civil defense [in

¹ James N. Gibson, “History of the Army’s Nuclear Capable Rocket Program,” *Field Artillery Bulletin*, August 1987, 20.

² See A.J. Bacevich, *The Pentomic Era: The US Army Between Korea and Vietnam* (Washington, DC: National Defense University Press, 1986), 14-16.

the U.S. homeland] was to become the army's main task...."³ The Army Chief of Staff General Maxwell Taylor opposed the plan, as it would leave the United States with no alternative to a general nuclear war with the Soviet Union. "The other service chiefs greeted Taylor's [dissent] with silence. It was only the reaction in Congress and in European capitals to the publication of elements of the plan in the *New York Times* on 13 July that caused Eisenhower to bury the Radford Plan."⁴ It is against this backdrop that the Army's leadership struggled to make sense of the atomic era and find its place within it

Like their naval and air counterparts in the late-1940s, Army leaders recognized that atomic weapons were formidable and henceforth essential. How to adopt, and adapt to, them remained a puzzle, particularly as the initial atomic bombs could only be delivered by heavy bombers. Tests at Bikini Atoll in 1947, however, opened the possibility of tactical applications of low-yield atomic weapons. This provided a stimulus to Army thinkers, both as a way to challenge Air Force primacy in the nuclear field and to contemplate how atomic firepower might be applied to the ground battle. As a study of this period notes:

Virtually all Army officers agreed that ground forces should be equipped with tactical atomic weapons to facilitate an integrated conventional-atomic battlefield. There the agreement ended. Recommendations for tactics, command and control, employment and targeting widely varied and indicated the absence of any Army doctrinal foundation for atomic thought and strategy.⁵

Lack of a clear vision stemmed from an incomplete understanding of the technology and its impact. As the War Department asserted in 1947:

Military tactics are relatively unaffected by the advent of the atomic bomb. Until it has been demonstrated that the atomic bomb

³ Ingo Trauschweizer, *The Cold War U.S. Army: Building Deterrence for Limited War* (Lawrence, Kansas: University Press of Kansas, 2008), 64.

⁴ *Ibid.*, 64-65.

⁵ Lieutenant Allan Gary Maiorano, USN, "The Evolution of the United States and NATO Tactical Nuclear Doctrine and Limited Nuclear War Options, 1949-1984," Master's Thesis, Naval Postgraduate School, December 1983, 30-31.

can achieve a decision by itself (and the certainty that it can has yet to be demonstrated), conventional military operations will continue to be employed, using for some time to come, substantially the tactics of the end of World War II, characterized by constantly increasing speed of movement and more concentrated power....⁶

In short, confronted with the unknown, the Army would treat atomic weapons as bigger conventional munitions and figure out how to integrate them into established practices. This process of conceptualization played out for a number of years:

Between 1945 and 1954 forty articles appeared in *Military Review* – a professional journal of the U.S. Army – addressing atomic/nuclear combat. The diversity of the articles and author's views reflect the lack of firm consensus among Army officers as to how ground forces, equipped with tactical atomic weapons, would be employed on the battlefield.⁷

At the center of the Army's atomic thinking was the Command and General Staff College (CGSC), where instruction on nuclear combat began in 1947.⁸ After the Soviet Union exploded its first atomic device in 1949, CGSC Commandant Lieutenant General Manton Eddy convened a faculty group to establish doctrine for the tactical use of atomic weapons and to propose associated materials for the college curriculum. The result was the Army's first doctrine on atomic warfare, Field Manual (FM) 100-31, *Tactical Use of Atomic Weapons*, published in November 1951. Originally classified confidential FM 100-31 (1951) reflects the uncertainty of the time – many technical details of atomic weapons were held at higher classification levels and concepts for their use were still evolving. The overall thrust was that atomic weapons were not all-powerful and should be integrated with other weapons when used tactically. While

⁶ "War Department Thinking on the Atomic Bomb," *Bulletin of the Atomic Scientists* 3, no. 6 (June 1947): 155-168. The memo was written by Dr. Bernard Brodie and cleared with War Department officials.

⁷ Maiorano, *op. cit.*, 31.

⁸ A class on "Trends in Warfare" introduced the notion that the atomic bomb might support ground operations. See Major John P. Rose, USA, *The Evolution of U.S. Army Nuclear Doctrine, 1945-1980* (Boulder, CO: Westview Press, 1980), 83.

modification to organization, tactics, and techniques were called for, atomic weapons did not fundamentally alter the principles of war. Care was to be exercised by the field commander when using atomic weapons not because of their political sensitivity but rather their great destructive power.⁹ FM 100-31 (1951) incorporated many ideas advanced in Army professional journals:¹⁰

Specifically, FM 100-31 recommended the widespread use of atomic missiles over a short period of time to disrupt attacking enemy formations. Following the advice of Generals Groves and Ridgway, the manual advocated greater dispersion of troop formations, advising commanders to avoid large concentrations of man [*sic*] and material which presented lucrative targets to enemy atomic fire. Major changes in basic offensive doctrine were not suggested. Rather, the offensive was still based on combining firepower and maneuver, only now atomic weapons were incorporated into the operation.¹¹

FM 100-31 taught that the organization and conduct of defensive operations should be based primarily on conventional weapons available.... In the defensive, atomic weapons were envisioned for use against enemy troop concentrations, command and control agencies, means of mobility, and logistical installations.... “Maximum results are obtained if atomic explosions employed defensively are exploited by offensive maneuver to destroy enemy forces disorganized by the explosions.”¹²

In addition to dispersion, the manual emphasized, “passive protection measures, employment of mobile reserves, and active security measures [i.e., counter-air and counter-battery fire missions].”¹³

⁹ Ibid., 85. See also, Maiorano, *op. cit.*, 33.

¹⁰ Donald A. Carter, *Forging the Shield: The U.S. Army in Europe, 1951-1962* (Washington, DC: United States Army Center of Military History, 2015), 55.

¹¹ Maiorano, *op. cit.*, 34-35.

¹² Rose, *op. cit.*, 86.

¹³ Ibid.

FM 100-31 (1951) was not without its skeptics among the Army's officer corps. For instance, Brigadier General Herbert Loper, Chief of the Armed Forces Special Weapons Project (AFSWP, the predecessor to the Defense Atomic Support Agency), dismissed the notion that the atomic bomb was a tactical weapon.¹⁴ Writing in *Military Review*, Army Colonel Maddrey Solomon took issue with the concept at the heart of the new doctrine – dispersal: “...dispersion on the level necessary to thwart the effects of atomic explosions is a sure way to defeat. It divides the force – men and materiel – required to win...dispersion in the offensive, as well as the defensive, spells doom.”¹⁵

Instead, the colonel proposed a twofold alternative – “calculated risk” and “atomic superiority:”

A calculated risk...may be defined as a command decision, made after an estimate of the situation, that an operation will be conducted against acceptable odds.

...Every capability of the enemy to deliver an atomic blow must be plotted as to place and time. The resulting losses must be calculated carefully. Replacement units must be ready to fill the gaps.... After the plan is completed and the odds calculated, the commander must [decide] – shall the operation be undertaken? If the calculations prove that the losses are unacceptable or that the mission cannot be accomplished, the decision is negative. Conversely, if the plan reveals, by war gaming, that the mission can be accomplished with acceptable losses, the operation order is issued.

Local atomic superiority...may be defined as the ability of one nation to employ atomic weapons in a given area of operations while its enemy is denied that capability.... In order to win atomic superiority in an area of operations, absolute command of the air is a primary and essential requisite. This means that no enemy airplane will be permitted to fly over the given area on a bombing

¹⁴ Ibid., 85.

¹⁵ Colonel Maddrey A. Solomon, USA, “Dispersion is ‘Not’ the Answer,” *Military Review* 31, no. 3 (June 1951): 43.

run...the enemy must [also] be incapable of launching atomic missiles against the operation. This also will require a tremendous effort. The pinpointing of launching sites, their subsequent destruction...all add to the difficulty of the operation. Should bombardment from the air prove incapable of accomplishing local atomic superiority, airborne troops must do the job.

In a like manner, enemy artillery, capable of firing atomic shells must be rendered useless. This may be accomplished by counterbattery operations, air bombardment, employment of drone planes and missiles, partisan warfare, and, if necessary, airborne troops.

The winning of local atomic superiority will not be an easy assignment. A great deal of force and time will be expended in such operation...if the calculated risk alone is unacceptable, the commander has no choice but to accept the battle for local atomic superiority.¹⁶

Notably, to attain local atomic superiority, the integrated use of all arms, atomic, conventional, and non-conventional, against the enemy's atomic-capable forces was envisioned.

In terms of balancing the two considerations:

*Recommended Read: Solomon's
"Dispersion is 'Not' the Answer,"
Military Review, June 1951.*

...it may appear that the surface operations, in a future war, can be conducted only by taking a calculated risk

or after a long and laborious effort in which some degree of atomic superiority is attained. This is not necessarily true. The solution lies in a combination of each of the essentials - calculated risk and local atomic superiority.... At some time during the operation to gain local atomic superiority, the odds will become acceptable. At that time, with the calculated risk carefully considered, the ground action will begin. This will be the answer, the winning combination, for successful ground or surface operations against an enemy possessing an atomic attack capability.¹⁷

¹⁶ Ibid., 46.

¹⁷ Ibid., 43-46.

While Army thought leaders would continue to debate the parameters of atomic doctrine, the importance of FM 100-31 (1951) as the Service's first institutional statement on, and guidance for, operations in the atomic age should not be overlooked in that, "the Army followed, perhaps for the last time, the most rational sequence of strategy development: doctrine and employment guidelines *preceded* the field deployment of the first tactical atomic weapons. Simultaneously, office training at the CGSC was expanded and revised so that 'consideration on the tactical employment of atomic weapons was included in twenty-seven separate subjects.' Officer preparing to enter the field were at least moderately familiar with atomic weapons, their effects, and the Army's concept of employment."¹⁸

This atomic education did not come easily. In 1946, the War Department, which oversaw the Army, established a three-phase plan for the "complete integration of atomic energy instruction into our training and school system." Phase I entailed orientation of senior commanders and War Department planners. Phase II provided training of instructors at major commands and service schools. Phase III broadened that instruction to personnel throughout the Army and developed plans for additional training as needed in the future. Phases I and II were completed in 1946. Phase III was never initiated, largely because the aforementioned AFSWP was assigned the responsibility for training individuals and units for all services. Yet, from 1947 to 1952, few individuals and units of the Army were trained by AFSWP. "This could be justified on the basis that the Army at the time had no nuclear capability and, therefore, required only a small number of trained personnel. In addition, the curriculums of Army service schools did not include adequate nuclear weapons instruction; they contained fewer hours on nuclear subjects in 1952 than were prescribed in 1946."¹⁹

Nonetheless, the Army conducted its own nuclear weapons employment course (NVEC) at CGSC, beginning in 1952 and modeled it on the AFSWP course being taught at Sandia base in New Mexico:

¹⁸ Maiorano, *op. cit.*, 35. Emphasis in the original.

¹⁹ Information in this paragraph is from Major DeBow Freed, USA, "Nuclear Weapons Employment Training," *Military Review* 40, no. 1 (April 1960): 62.

The Army course...was eight weeks long and was relatively technical with respect to the average officer's background and probably future needs. It emphasized the technical details of nuclear weapons and target analysis rather than the broad knowledge of nuclear weapons and their effects. Such a curriculum did much to engender the feeling throughout the Army that nuclear weapons employment was a technical subject, filled with pitfalls for the average officer, and properly a sphere for a modern-day specialist with his slide rule.²⁰

These early educational efforts were matched by field exercises, some of which involved atmospheric nuclear weapons tests. In late 1951, the Army participated in the Desert Rock I-III exercises in Nevada, moving hundreds of troops near ground zero shortly after nuclear detonations to test tactics, equipment, and psychological responses. Detonations in the test series ranged on the very low end from less than .1-3.5 kilotons (kt)²¹ upwards to 14-31 kt. In early 1952, the Army conducted its first regular maneuver to include the simulated use of atomic weapons. Exercise SNOWFALL, held in upstate New York, featured friendly and aggressor forces dropping notional atomic bombs from aircraft to break up enemy formations and facilitate ground maneuver. Commanders on both sides experimented with target selection procedures and the effects of atomic explosions on troops and equipment.²²

U.S. Army, Europe (USAREUR) held its first in-depth experiment with atomic warfare that September, when U.S. Seventh Army participated in the North Atlantic Treaty Organization's (NATO's) MONTE CARLO exercise:

About 175,000 troops, including 120,000 Americans, 27,000 Belgians, 22,000 French, and 6,000 British participated in the effort, the largest inter-allied maneuver since World War II. The official objectives of the exercise were to test liaison between allied commands, to emphasize offensive operations, to perfect

²⁰ Ibid., 63.

²¹ Years later, a number of these test veterans submitted medical claims to the government believing their health may have been affected by exposure to radiation released by the detonations. *Operation Buster Jungle 1951*, Report for the Defense Nuclear Agency by JRB Associates, 21 June 1982, Preface, 26, 46-57.

²² Carter, *op. cit.*, 55.

air-ground techniques, and to make effective use of mines and demolitions. Without a great deal of public comment, however, NATO and USAREUR planners also designed the maneuver to focus on the development of atomic warfare techniques and the employment of atomic weapons. One purpose of the effort, they said, would be to instill in participating soldiers an “atomic mindedness” and to dispel misconceptions about the use of atomic or chemical weapons. To do that, the maneuver would test the ability of ground forces to communicate with air units capable of delivering atomic weapons, to concentrate quickly from widely dispersed positions, and to coordinate their movements with air support because an atomic bomb explosion could disrupt an attacking armor formation. Since atomic weapons could also rupture the strongest enemy defenses, attacking ground units would also attempt to synchronize their movements with aircraft delivering atomic munitions in the final phases of an assault.²³

Reflecting the limitations of the time, the USAREUR exercise report noted that poor weather had prevented many aircraft from flying, which curtailed atomic bombing simulations. Moreover, the U.S. Twelfth Air Force had not established a Tactical Air Control Center at the Seventh Army command post for the exercise, indicating disagreement between the two services on air support arrangements.²⁴ These early exercises indicated that, “under the geographical conditions of Central Europe, a conflict in which both sides used nuclear weapons would require not less but more manpower than conventional warfare, mainly because of the greater depth of the battle zone and the higher casualties.”²⁵

Back in the schoolhouse, the tactical problems assigned to CGSC students provide a window into the Army’s early thinking about tactical atomic warfare. For instance, in the 1952 “Infantry Division in the Attack” problem, the corps was assigned six atomic weapons ranging from 15 to 60 kt of explosive power. The aggressor was likewise given a limited

²³ Ibid., 101-102.

²⁴ Ibid.

²⁵ Wolfgang Heisenberg, “The Alliance and Europe: Part I: Crisis Stability in Europe and Theatre Nuclear Weapons,” *Adelphi Papers* 96 (Summer 1973): 1.

atomic capability without any indication of its intent to use it. By 1955, the same problem featured a nearly ten-fold increase in the number of atomic weapons available to the corps. Now, it had 50 atomic weapons available for an attack lasting three days. Students were informed that beforehand, the corps had been using nuclear weapons at the rate of 30 per week. In another tactical problem that year, the aggressor force was assumed to be using 15 atomic weapons per week with yields ranging from 15 to 100 kt within an army-wide area of operations. In that problem, the defending corps allocated four 20 kt weapons to the division for use over a seven-day period. Notably, these tactical problems through the years commenced with a strategic nuclear exchange between the United States and the Soviet Union. The scenarios then called for a corps offensive beginning in West Germany and carried to Soviet-occupied Eastern Europe.²⁶

The CGSC tactical problems of the period are noteworthy for several reasons. First, they underscore that atomic weapons were not viewed as transformational but rather a new source of immense firepower to be factored into traditional planning processes. Second, as tactical atomic weapons became feasible, more and more of them were added to the scenario. This reflected an expectation that such weapons soon would be available in quantity to forces in the field. Third, students were basically unconstrained in how they employed the allotted weapons, other than accounting for the safety of nearby friendly forces. This relative lack of restrictions was consistent with national guidance. In November 1953, National Security Council (NSC) memorandum 162/2 directed that, “In the event of hostilities, the United States will consider nuclear weapons to be as available for use as other munitions.”²⁷ Lastly, there was a presumption in the scenario that conflict between the United States and the Soviet Union would *begin* at the strategic nuclear level rather than escalate there from conventional conflict. While only a scene-setter for the student exercise, the scenario nonetheless mirrored Army views that, “no matter how decisive the high-yield weapons of the Strategic Air Command (SAC) were, the Air Force could not fulfil such critical tasks as post-attack territorial occupation and neutralization of enemy ground forces remaining after initial retaliation.”²⁸ In a sense, the CGSC tactical problems help

²⁶ Information in this paragraph comes from Rose, *op. cit.*, 99-102.

²⁷ NSC 16/2 quoted in David Alan Rosenberg, “The Origins of Overkill: Nuclear Weapons and American Strategy, 1945-1960,” *International Security* 7, no. 4 (Spring 1983): 13.

reassure the Army's own officer ranks that "Ground forces were still vital to the U.S. defense effort."²⁹

Atomic weapons remained a subject of intense study by the Army during this time. The Army participated with the Air Force and Navy in the 1951-1952 Project Vista study, which made the case for tactical use of nuclear weapons on the battlefield.³⁰ General James Gavin represented the Army in the study, which, along with his subsequent command of Seventh Corps in West Germany, would have a major impact on his thinking about Army organization and doctrine in the atomic age.³¹

From 1954 to 1956, the CGSC conducted three major studies on doctrine and its teaching. The first of these, the Easterbrook Committee, found that atomic considerations were not integrated throughout the CGSC curriculum but confined to "atomic" units or smaller sections of instruction. The Committee's findings led CGSC to establish a 50-50 balance of atomic vs. conventional instruction. In June 1956, the Educational Survey Commission found that CGSC instruction merely superimposed atomic considerations on World War II-type tactical scenarios. This pattern was upended by a directive two months later from the Commander, Continental Army Command (CONARC) that CGSC and all the combat branch schools were henceforth "to depict atomic warfare as the typical and to treat nonatomic warfare as a modification of the typical."³² Lastly, the Clow Committee criticized Army atomic instruction as unrealistic and inaccurate. The Committee recommended attention be directed to, *inter alia*, troop safety precautions, the influence of fall-out effects and neutron-induced radiation, and post-atomic strike damage assessment.

Accordingly, Army training and education efforts began to prioritize

²⁸ Maiorano, *op. cit.*, 30.

²⁹ Ibid.

³⁰ Fearing that tactical atomic weapons would compete with SAC's strategic nuclear mission, the Air Force suppressed the Project Vista report. See Chapter Three, 183.

³¹ Trauschweizer, *op. cit.*, 49. Gavin had been assigned to the JCS/DoD Weapons Systems Evaluation Group in 1949 to study the possible tactical employment of nuclear weapons. He also participated in the 1954 Council on Foreign Relations study that led to Henry Kissinger's seminal book *Nuclear Weapons and Foreign Policy* (New York: Harper Brothers, 1957).

³² Quoted in Rose, *op. cit.*, 88-19.

tactical atomic warfare. In 1956, CGSC created a Department of Nuclear Weapons. As directed by CONARC, CGSC also established that year a two-week Senior Office Nuclear Weapons Employment Course:

The course provided training for senior officer in tactics, logistics, techniques, procedures, technical considerations and operations involved in the employment of nuclear weapons. From the first course presentation in March 1957 to May 1959, 25 classes were attended by 1,453 officer of which 191 were general officer – 3 lieutenant generals, 68 major generals, and 120 brigadier generals. The course accent was on nuclear ground combat operations in a tactical and support sense rather than on detailed knowledge of nuclear effects.

Later in the 1956-1957 school year, the college was directed to incorporate additional nuclear weapons training to permit the awarding of the military occupational specialty [MOS] “prefix 5” (Nuclear Weapons Employment Officer) to CGSC students³³

Additional effort was devoted to reviewing the Army’s force structure. Under pressure from the Eisenhower Administration to adopt a “New Look” that would reduce costs by relying more on atomic weaponry, Army Chief of Staff General Matthew Ridgway in 1953 directed Army Field Forces to study the problem. The result was the 1954 Atomic Field Army (ATFA) study. ATFA introduced an experimental organization that:

...reduced and consolidated many of the service and support elements, reduced the size of the division artillery, and cut the number of infantry battalions in the infantry division from nine to seven. Instead of the previous organization of three infantry regiments, infantry divisions were to create task forces as the situation required, under the direction of smaller combat command headquarters. The reorganization cut nearly four thousand men from the infantry division and almost twenty-seven hundred from the armored division.³⁴

Field tests in 1955 indicated that, “while the concepts held some

³³ Ibid., 91-92.

³⁴ Carter, *op. cit.*, 256-257.

promise, they required a great deal of new equipment, especially radios and personnel carriers, before the Army could implement a complete reorganization. Also, many officer throughout the service were reluctant to let go of traditional organizations and doctrines with which they were more familiar.”³⁵ Even as the organizational implications were being worked out, the first atomic-capable delivery systems started making their way to Army units.

Besides the Manhattan Project, the Army had other advanced weapons in the pipeline before the Second World War ended. In 1944, it initiated the Corporal missile as America’s response to the German V-2 rocket. In February 1945, the War Department awarded a contract to Bell Laboratories to investigate the feasibility of a guided surface-to-air missile (SAM) to intercept the jet aircraft emerging at the time. In October, the Army formed its first guided missile battalion to create a cadre of specialists who would operate the various types of missiles that were sure to come.³⁶ In April 1946, the Army launched its own version of the V-2 at White Sands, New Mexico and had already conceived of a nuclear-armed intercontinental ballistic missile: “By research and development, the Ordnance Department hopes to increase the range of this [rocket] to 5,000 miles and to load its warhead with atomic explosives.”³⁷ Also in 1946, the Army envisioned nuclear-armed SAMs to thwart massed bomber attacks.³⁸ In May 1949, *Field Artillery Journal* assured its Army readers that, “Guided missiles are guided artillery shells and the artilleryman will simply include them as another weapon to support ground combat troops.”³⁹ Following the Soviet atomic test that August, Congress authorized by year’s end a nuclear warhead for the Corporal missile and a feasibility study on the nuclear-capable Honest John rocket.⁴⁰ Also in 1949, the Army’s Picatinny Arsenal was tasked to create a nuclear-capable cannon.

³⁵ Ibid., 257.

³⁶ Lieutenant Colonel J.W. Rawls, USA CAC, “AGF Guided Missile Battalion,” *Field Artillery Journal* 36, no. 6 (June 1946): 334.

³⁷ Major Hal D. Steward, USA, Inf., “Artillery of the Future?” *Field Artillery Journal* 36, no. 6 (June 1946): 332.

³⁸ Lieutenant Colonel William R. Kintner, GSC, “Guided Missiles Are Coming,” *Field Artillery Journal* 36, no. 9 (September 1946): 535.

³⁹ Captain Nels A. Parson, USA FA, “Guided Missiles – the Artilleryman’s Answer,” *Field Artillery Journal* 39, no. 3 (May-June, 1949): 112.

Army-Air Force friction over which service should control nuclear air support missions encouraged the Army to acquire nuclear-capable missiles and artillery and impeded joint doctrine for nuclear-conventional operations.

In some respects, the Army had little choice but to regain an atomic weapons capability. Institutionally, it had to find relevancy in the eyes of a president who deemed ground forces obsolete and lavished billions of dollars on strategic nuclear bombers - at the Army's expense. General Taylor claimed that his requests for basic conventional arms were returned by Secretary of Defense Erwin Wilson, who instead advised the Army to

invest in "newfangled" items with public appeal. Taylor conceded that nuclear weapons "were the going thing and, by including some in the division armament, the Army staked out its claim to a share in the nuclear arsenal."⁴¹ In addition, friction persisted with the newly independent Air Force. Tensions over who was in charge of nuclear air strikes in support of ground forces became so high that the two services stopped conducting joint exercises by the mid-1950s and moved to separate, parallel training.⁴² Organic nuclear artillery and long-range rockets would break the Army's dependency on the Air Force for atomic support.⁴³

Accordingly, in May 1953, the Army successfully detonated in the Nevada desert an atomic projectile test-fired from its 280 mm "Atomic Annie"

⁴⁰ Gibson, *op. cit.*, 21.

⁴¹ This episode is recounted in Tauschweizer, *op. cit.*, 56.

⁴² As noted in Chapter Three, this struggle is detailed in Ralph D. Bald, *Air Force Participation in Army-Air Force Training Exercises, 1951-1954*, USAF Historical Division, Research Studies Institute, Air University, September 1957.

⁴³ Carter, *op. cit.*, 102.

cannon (see Figure 1);⁴⁴ the first two-gun battery was deployed to West Germany that October. On balance, “The guns lacked the range and flexibility of aircraft delivered munitions, but they provided a far greater measure of accuracy and reliability. Most important, unlike the Air Force, they could provide atomic fire support to Army ground units at night and in any kind of weather.”⁴⁵ Within a couple of years, the Corporal guided missile and the Honest John unguided rocket also were deployed to West Germany. Defensively, the Army’s Nike Ajax entered service in 1954, the world’s first operational SAM. Already in development by the Army was a successor program to equip Nike with a nuclear warhead, as was a 1,000-mile, intermediate range ballistic missile (IRBM), the Jupiter.



Figure 1: ‘Atomic Annie’ 280 mm cannon test firing, 1953. Photo credit: U.S. Army.

In essence, by the mid-1950s, the Army's Ordnance Department was able to turn out nuclear-capable delivery systems faster than Army doctrine or organization could accommodate. As a result, the 280 mm cannon and the Corporal missile were "grafted onto existing conventionally oriented organizations at the highest possible level."⁴⁶ As a RAND study observed, "Armored divisions retained the World War II-type combat command structure, with the exception that an Honest John rocket battery was added to each for nuclear capability."⁴⁷

Thus, as the Army’s first phase of nuclear and conventional synchronization drew to a close, the service had begun to recover from the loss of its dominant nuclear position at the end of World War II by fieldin

⁴⁴ Armed Forces Special Weapons Project, *The 280 MM Gun at the Nevada Proving Ground*, 1953, <https://archive.org/details/The280mmGunattheNevadaProvingGround1953>.

⁴⁵ Ibid.

⁴⁶ Lieutenant Colonel John D. Skelton, USA, “The Forbidden Weapon – The Employment of Army Tactical Nuclear Weapons,” Monograph, U.S. Army Command and General Staff College, February 1991, 16-17.

⁴⁷ Richard W. Kedzior, *Evolution and Endurance: The U.S. Army Division in the Twentieth Century*, RAND, 2000, 26.

nuclear-capable delivery systems. The Army issued its first doctrine on tactical use of atomic weapons, and studies explored how troops could survive and prevail on a nuclear battlefield. What lay ahead was how to instantiate doctrine and organization to enable Army units to conduct both conventional and nuclear operations.

2. Restructuring for Dual Capability and Limited Wars (Late 1950s-Early 1960s)

In its second phase of nuclear-conventional synchronization, the Army undertakes a bold experiment to alter unit organization to meet the demands of the atomic battlefield: the so-called “Pentomic” division. Conceived and implemented in the mid- to late-1950s, the Pentomic division no sooner takes shape than political shifts at home and abroad render it outmoded.

Like the Air Force, the Army was struggling at this time with how to balance conventional and nuclear weapons. Philosophically predisposed to massive retaliation and beneficiary of investments in the requisite strategic forces, the Air Force fully embraced nuclear weapons and moved to divest itself of conventional weapons in the late-1950s.⁴⁸ By contrast, Army leaders opposed massive retaliation because to carry it out would kill hundreds of millions of innocents, they contended, including amongst the European Allies. Moreover, once the Soviet Union had a matching strategic nuclear capability, the U.S. threat to invoke massive retaliation would lose credibility. Army leadership thus argued that the mutual risk of nuclear annihilation would keep conventional conflict and even limited atomic employment from escalating to strategic nuclear war.⁴⁹ Inattention to the former left the United States ill prepared for more likely forms of conflict, they argued, yet was where the Army could make a decisive contribution.⁵⁰ Army opposition to massive retaliation ran so deep that a

⁴⁸ See Chapter Three, 180.

⁴⁹ Tauschweizer, *op. cit.*, 63.

⁵⁰ Generals Gavin and Taylor were particularly outspoken in this regard. See Bacevich, *op. cit.*, 43-44.

group of its staff officers leaked classified documents to the press in the so-called “Colonels’ Revolt” of 1956, detailing the service’s dissatisfaction with the strategy.⁵¹

This is not to suggest that the Army was opposed to nuclear weapons *per se*. Taylor “believed that the possession of tactical nuclear weapons served as a deterrent, prevented the enemy from massing forces in war, and limited aggression. Their use would offset the Soviet numerical advantage in ground forces and bring about the stalemate that would force the enemy to decide whether to escalate.”⁵² Rather, the question was whether the Army should develop specialized units for different types of combat – atomic, conventional, and non-conventional (i.e., counter-insurgency). In an era of constrained budgets, the Assistant Commandant of the CGSC, Brigadier General William F. Train, provided the answer:

*Because the initiative in determining whether atomic weapons will be used at the start of a future war may well rest with the enemy, we cannot afford the luxury of one type unit [sic] to fight an atomic war and another to fight under nonatomic conditions. Our tactics, organization, and equipment must be adaptable to either.”*⁵³

Recommended Read: Assistant Commandant of the CGSC BGEN Train’s “Atomic Challenge,” Military Review, November 1956.

These sentiments were shared by General Taylor: “this duality – the built-in capability

to use atomic and non-atomic weapons in any combination” is a “basic necessity.”⁵⁴ Moreover, Army leaders rationalized that if they could resolve the dilemmas of the atomic battlefield they could certainly meet the lesser demands of conventional warfare, and so focused their efforts on the former.⁵⁵

⁵¹ Ibid., 45. For a detailed treatment of the “revolt,” see Major J. M. Parker, USA, “The Colonels’ Revolt: Eisenhower, the Army, and the Politics of National Security,” Naval War College Paper, June 17, 1994.

⁵² Trauschweizer, *op. cit.*, 63.

⁵³ Brigadier General William F. Train, USA, “The Atomic Challenge,” *Military Review* 36, no. 8 (November 1956): 5. Emphasis in the original.

⁵⁴ Quoted in Bacevich, *op. cit.*, 62-63.

⁵⁵ Ibid., 63.

Train aptly summarized the challenge confronting Army planners:

If we are to use atomic weapons most efficiently, we must have:

1) the desired numbers and yields of weapons and delivery means with the accuracy to meet the requirements of troop safety and with the range to engage targets which can immediately affect our operations, 2) the ability to obtain accurate and timely intelligence, 3) the forces and tactics to exploit fully the advantages produced by atomic weapon effects.

On the other hand, to neutralize the advantages accruing to the enemy through his use of atomic weapons we must: 1) reduce the enemy's atomic capability as far as possible by destroying his weapon stockpile, delivery means, and industrial facilities, 2) deprive the enemy of information on our forces, 3) devise procedures and tactics to minimize the effects of any weapons delivered against our forces.⁵⁶

Train did not underestimate the difficulty of adapting to the atomic battlefield. He warned, "Those concerned with the development of doctrine for future warfare find many contradictions, some of which must be solved temporarily by assumptions. A few of these contradictions indicating the complexity of...future atomic or nonatomic war are: limitations on dispersion and risks inherent in mass; reliance on radio for control in the face of electronic countermeasures [and] doctrine versus unproved concepts."⁵⁷ For the general, the risks and rewards were nonetheless clear:

If we believe the advent of nuclear weapons presents an unsurmountable problem to the strategist, tactician, and logistician, we have begun to lose the flexibility and imagination without which we are doomed to defeat. If we accept this

⁵⁶ Train, *op. cit.*, 4-5.

⁵⁷ *Ibid.*, 11-12.

*technological advancement as the greatest challenge in centuries of military operations, we can make this force the basis for the preservation of peace – or for victory in war if the need arises.*⁵⁸

Taking up the charge was the Army's "Airborne Club," Generals Ridgway, Taylor, and Gavin, each of whom commanded airborne divisions during World War II. As an Army professor of history described them:

Undeniably brave, fiercely intelligent, and supremely competent, they had been part of a new and daring experiment in warfare – the airborne division – which brought them notable battlefield and career success. By 1953 their skills and drive had catapulted them into the highest positions of leadership in the Army.

When confronted with the challenge of how to deal with a nuclear battlefield these men predictably incorporated into their response both the general and specific features of their experiences in parachute operations. They adhered less strongly to traditional systems, sought bold and imaginative solutions, and accepted radical new concepts.⁵⁹

Simultaneous to the 1953 ATFA study, General Ridgway directed the Army War College to undertake its own examination of the integrated battlefield which the College presented as "Doctrinal and Organizational Concepts for Atomic-Nonatomic Army during the Period 1960-1970." The study called for infantry, armor, and airborne divisions to be replaced by a standard combat division. This new division would have only 8,600 men and officers be fully air-transportable, and possess its own tactical nuclear weapons. The division would replace the typical three-regiment structure with five smaller battle groups that were self-sufficient. This restructuring gave rise to the study's moniker – "PENTANA," for penta (five-sided

⁵⁸ Ibid., 14. Emphasis in the original.

⁵⁹ Kalev I. Sepp, Lt. Col., USA (ret.), "The Pentomic Puzzle: The Influence of Personality and Nuclear Weapons on U.S. Army Organization 1952-1959," *Army History* 51 (Winter 2001): 8-9.

atomic-nonatomic army. PENTANA met with instant criticism on the grounds that the new organization lacked firepower and staying power. Taylor, who had succeeded Ridgway as Chief of Staff in June 1955, had his own doubts about PENTANA, such as the practicality of a universal division and its ability to achieve dual atomic-nonatomic capability. Nonetheless, he approved the PENTANA concept a year later as a long-term Army objective.

The Army's "Pentomic" division had no comparable force structure experiment in the Air Force or Navy during the Cold War

In the meantime, the Airborne Club honed its own thinking about restructuring. Based on map exercises and maneuvers, the airborne generals concluded that existing infantry and airborne divisions could not survive on

an atomic battlefield⁶⁰. The armored division, on the other hand, was survivable; it had a flexible combat command structure, and tank crews were protected from radiation to a degree by their armor. Accordingly, armored divisions would be spared reorganization, which came as a relief to the armor community. General Taylor thus focused on organizing new infantry and airborne divisions, each comprised of around 12,000 to 13,000 men and officers (a decrease of about 3,700 to 5,000 men, respectively), five battle groups (based on experiments he carried out in Korea⁶¹), and tactical nuclear weapons. Similar in some respects to the PENTANA study, Taylor branded this new unit a "Pentomic" division (i.e., composed of five atomic-armed battle groups, see Figure 2)⁶²

The Chief of Staff intentionally made atomic weapons organic to the Pentomic division to force commanders to think more intensely about their proper employment, which was still largely unexplored.⁶³ In essence:

⁶⁰ Gavin reached this conclusion as early as 1952. See Trauschweizer, *op. cit.*, 49.

⁶¹ Sepp, *op. cit.*, 10.

⁶² Information in this paragraph is drawn from Trauschweizer, *op. cit.*, 52-53.

⁶³ *Ibid.*, 53.

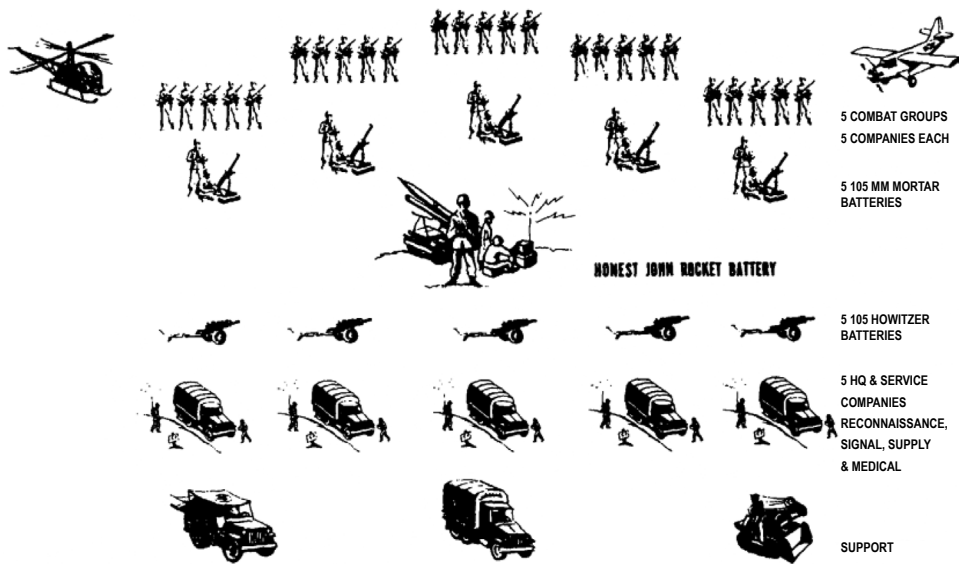


Figure 1: The Pentomic Division with nuclear rocket battery at its core.

The new Army that leaders such as Taylor sought was not simply a conventional force with a few oversized nuclear tipped missiles tacked on as an afterthought. Instead, these new leaders wanted an Army that had integrated nuclear capabilities into all of its operations.⁶⁴

The Pentomic reorganization was launched in 1956 as a five-year experiment. It was geared to the needs of the atomic battlefield – non-linear dispersal of smaller, highly mobile units over a wider area, rapid concentration of those forces for attack, and quick re-dispersal to deny the enemy a worthwhile target for nuclear attack. The experiment was risky in that much of the necessary equipment, such as armored personnel carriers (APCs), more reliable helicopters, and communications systems, were not yet available. The compressed timeline seems to have been driven by Taylor’s desire to prove the concept in time to lobby Eisenhower’s successor for the equipment needed to bring it to full fruition.⁶⁵

⁶⁴ Bacevich, *op. cit.*, 94.

⁶⁵ Trauschweizer, *op. cit.*, 54.

The 101st Airborne Division, which Taylor had commanded during World War II, was the first to make the Pentomic switch, in the fall of 1956. Other combat arms remained reluctant to embrace the new organization, however. Ironically:⁶⁶

The Pentomic division was one of the few Army initiatives of the 1950s to attract President Eisenhower's enthusiastic support. The President believed that reducing the size of the division would allow the Army to accept further reductions in its overall personnel strength while maintaining the same nominal force structure.⁶⁷

Army efforts in the 1950s to integrate nuclear weaponry into force structure and doctrine benefitted greatly from the support of senior leaders in USAREUR and Seventh Army, which functioned as a vast training ground in which to test and refine concepts.

Pentomic conversions picked up speed in 1957. The 10th Infantry Division converted by July, the 8th Infantry Division by August. All conversions were completed by late 1958. U.S. Seventh Army in West Germany played a central role in testing the Pentomic structure.⁶⁸ As with the PENTANA concept, the Pentomic division was found to be lacking in such critical areas as fire support, mobility, and communications. Specifically, there

were only enough APCs to move one of the five battle groups at a time; radio systems were unable to meet the demands of coordinating the five battle groups; and,

Most damagingly for an army that relied upon the application of heavy firepower, the commanding general of Seventh Army artillery concluded that the pentomic infantry division had insufficient conventional and atomic firepower He concluded that the reorganization had taken away the strength of American artillery: centralized command, flexibility, and massing capability.⁶⁹

⁶⁶ Carter, *op. cit.*, 258.

⁶⁷ Bacevich, *op. cit.*, 169, n. 3.

⁶⁸ Trauschweizer, *op. cit.*, 92-98.

⁶⁹ *Ibid.*, 96.

Logistics support of the Pentomic structure similarly suffered from major deficiencies particularly in terms of mobility – there simply were not enough trucks and drivers to move materiel when and where needed. Its small, isolated battle groups would fall prey to numerically superior conventional forces, forcing them to rely on early and liberal use of nuclear weapons.⁷⁰ In the ensuing tactical nuclear exchange, an Army platoon leader observed that dispersal of the battle groups would provide inadequate protection given blast radii and subsequent radiation.⁷¹ Nonetheless, CONARC evaluated the Pentomic division favorably, declaring it well suited for both conventional and nuclear warfare.⁷²

Clumsy U.S./NATO statements about nuclear exercise casualties backfired and undermined European public support for the nuclear defense of the Alliance.

Political shifts at home and abroad in the late 1950s and early 1960s put a rapid halt to the Pentomic experiment. As details of the proliferated simulated use of nuclear weapons in NATO exercises

became publicly known, West Europeans were appalled. In particular, Exercise CARTE BLANCHE, conducted in Central Europe in June 1955, simulated the use of 335 tactical nuclear weapons over a 48-hour period by opposing forces. Exercise umpires estimated that 1.5 million soldiers and civilians were killed and another 3.5 million wounded, even before taking account of radioactive fallout. Designed to warn Soviet leaders and reassure skittish NATO allies, the exercise had an unexpected and counter-productive result:⁷³

The [casualty] estimate aroused a firestorm. Up until CARTE BLANCHE, there had been little public comment about the implications of a potential defense of Western Europe based on tactical atomic weapons. After it, however, the floodgate opened.

⁷⁰ Carter, *op. cit.*, 118-119.

⁷¹ Trauschweizer, *op. cit.*, 98.

⁷² *Ibid.*, 97.

⁷³ Henry Kissinger, *Nuclear Weapons and Foreign Policy* (New York: Harper & Brothers, 1957), 293.

Substantial discussion began among the European allies and within the international media on what would occur. Fritz Erler, the opposition Social Democratic Party speaker in the German Parliament questioned the relevance of German participation in Western Europe's defense if Germany was going to be devastated by atomic weapons anyway. Chancellor Adenauer called the CARTE BLANCHE report "frightening," and felt he was being stabbed in the back by his potential allies as he worked to make German participation in NATO a reality. In critiques of subsequent NATO exercises, the Germans questioned the excessive use of atomic weapons against what they considered inappropriate targets. They expressed particular concern about their use in areas where NATO policy had encouraged civilians to remain in their homes to prevent large flows of refugees.⁷⁴

Back at home, John F. Kennedy's run for the presidency in 1960 introduced a new direction in American military strategy. As a senator, Kennedy opposed massive retaliation, writing:

The Soviet acquisition of nuclear weapons and the means for their delivery...now makes certain that a nuclear war would be a war of mutual devastation. The notion that the free world can be protected simply by the threat of "massive retaliation" is no longer tenable...responsible leaders in the West will not and should not deal with limited aggression by unlimited weapons.⁷⁵

Kennedy found common cause with Taylor, who resigned as Army Chief of Staff in July 1959, frustrated with Eisenhower and the Joint Chiefs of Staff (JCS) for not heeding his advice. Taylor quickly published a critique of the Administration, *The Uncertain Trumpet*, which was read by Kennedy, who then invited Taylor to become his national security advisor during the 1960 presidential campaign.

⁷⁴ Carter, *op. cit.*, 241.

⁷⁵ Here, Kennedy was agreeing with the views of British soldier and strategist Basil Liddell Hart. See "Book Review by Senator John F. Kennedy of *Deterrent or Defense* by B.H. Liddell Hart," *The Saturday Review of Literature*, September 3, 1960, <https://www.presidency.ucsb.edu/documents/book-review-senator-john-f-kennedy-deterrent-or-defense-bh-lidell-hart-the-saturday-review>.

President Kennedy's concern over nuclear escalation marked a new era of political constraints on the use of tactical nuclear weapons.

Kennedy did not subscribe to all of Taylor's views, however. In particular, Kennedy did not believe that tactical nuclear use could remain limited, stating that, "Inevitably, the use of small nuclear armaments will lead to

larger and larger nuclear armaments on both sides, until the worldwide holocaust has begun."⁷⁶ As President, one of Kennedy's first policy changes was to reduce the military's dependency on nuclear weapons by enhancing conventional forces. In May 1961, Kennedy announced before Congress:

...I am directing the Secretary of Defense to undertake a complete reorganization of the Army's divisional structure, to increase its nonnuclear firepower, to improve its tactical mobility in any environment, to insure its flexibility to meet any direct or indirect threat, to facilitate its coordination with our major allies, and to provide modern mechanized divisions in Europe and new airborne brigades in both the Pacific and Europe.⁷⁷

Taylor's influence is clearly visible in this policy shift, and the President brought him back to active duty in order to make him Chairman of the Joint Chiefs of Staff (CJCS) in October 1962. While he finally had a president responsive to his advice, Taylor also had to accept trade-offs, including the dismantlement of his Pentomic divisions. The Kennedy Administration instead favored mechanization of infantry, something Taylor had set aside in fashioning the Pentomic division after his cherished airborne divisions. As an Army historian observed:

[In the 1950s, m]ilitary orthodoxy and doctrinal logic called for armoring and mechanizing most U.S. Army combat divisions in response to the introduction of tactical nuclear weapons.

⁷⁶ Quoted in Rose, *op. cit.*, 93.

⁷⁷ *Ibid.*, 95-96.

The rejection of this approach, in the face of all the available evidence and examples, can only be attributed to the coincidental positioning of Generals Ridgway, Taylor, and Gavin in the key leadership posts of the U.S. Army at the time the nuclear revolution arrived on the battlefield. All three opposed Eisenhower's massive retaliation doctrine. Their airborne-centered outlook, exacerbated rather than attenuated by their native intelligence and enhanced by their self-confidence, went unchecked by any proponent of a mechanized army.⁷⁸

In place of the Pentomic division, and with the influence of the Airborne Club receding, the Army now moved to the Reorganization Objective Army Division (ROAD). The ROAD division returned to the World War II-era triangular structure, with three combat brigades. Battalions once again became the basic tactical unit, replacing the Pentomic division's smaller battle groups. ROAD divisions were also significantly larger in order to enhance their conventional staying power. The new divisions retained the dual-capability of their Pentomic predecessors, however. The Seventh Army completed its conversion to ROAD divisions between February and October 1963. Table 1 shows the staffing levels of Army divisions over this period of experimentation and reorganization.

Division Type	Pre-Pentomic (1953-1955)	Pentomic (1956-1960)	ROAD (1961)	Percent Change (1956-1961)
Airborne	17,085	11,486	14,000	+21.9%
Infantry	17,455	13,748	15,000	+9.1%
Armor	~15,000	~15,000	~15,000	NA

Table 1: U.S. Army Division Staffing, 1953-1961 ⁷⁹

⁷⁸ Sepp, *op. cit.*, 11.

⁷⁹ Adapted from Maiorano, *op. cit.*, 90.

The Pentomic experiment proved too fleeting and shallow to have a lasting impact on the Army. No new edition of the basic Field Manual 100-5, *Operations*, was released between 1954 and 1962.⁸⁰ As a study of the period observed:

Army doctrine thus still emphasized infantry attacks at deliberate pace, supported by tanks and heavy artillery. Atomic artillery would blast a hole in the enemy's line of defense, enable ground forces to achieve a breakthrough, and afford armored and motorized formations the opportunity for maneuver. More important, atomic fire would shake the enemy so thoroughly that maneuvering units would encounter little resistance.... But this was a theoretical conception of the effect of atomic weapons rather than tactical doctrine for their employment.⁸¹

In short, "Tactical changes brought about by the reorganization of the combat divisions were not elevated to the level of doctrine,"⁸² underscoring a lack of institutional support.

Even as the Pentomic reorganization was taking shape, nuclear-capable delivery systems continued to flow to the field. By 1956, the Army could deliver nuclear weapons with the Corporal missile, Honest John rocket, 280 mm gun, and 8-inch howitzer. The same year saw the Army's aspirations for an IRBM set back, however. Secretary of Defense Wilson decided that the service would be limited to missiles with a range of 200 miles or less, in essence within army and corps boundaries. This put the Jupiter IRBM in doubt, although Wilson allowed its development to continue. The Secretary also decided that the Army could develop and deploy SAMs with a horizontal range of up to 200 miles, clearing the way for further improvements in the Nike program and giving the service a major role in air defense of the continental United States (CONUS).⁸³

⁸⁰ CGSC submitted a draft manuscript of FM 100-5 to CONARC in 1958, which potentially accounted for the Pentomic reorganization, but CONARC found the draft unacceptable and called for a complete re-writing. Trauschweizer, *op. cit.*, 271, n. 46.

⁸¹ *Ibid.*, 57.

⁸² *Ibid.*

⁸³ Carter, *op. cit.*, 255.

The competition between the Army and Air Force over which service's IRBM would be deployed reached a fever pitch in 1957. Reminiscent of the 1949 "Revolt of the Admirals,"⁸⁴ the Army took to leaking classified documents to cast doubt on the Air Force's Thor IRBM. The Air Force fought back claiming the Jupiter would not be operational until several years after Thor.⁸⁵ Outside events interceded. Following the Soviet Union's orbiting of the Sputnik satellite in October, President Eisenhower ordered the Pentagon to build *both* the Jupiter and the Thor in order to boost production and provide a back-up in case one system should fail.⁸⁶ In January 1958, the Secretary of Defense relaxed the 200-mile limit set on the range of Army missiles.⁸⁷

In June 1958, the Army's Redstone missile – forerunner to the Jupiter – was first deployed to West Germany. Like the Army's other missiles, it could carry either a conventional or nuclear warhead. In July, a Redstone launched over the Pacific Ocean became the first U.S. missile to test-fire a thermonuclear warhead.⁸⁸ The U.S. Army Artillery and Missile School declared that, "The Redstone can be used against troop concentrations, such as general reserve units; command installations, corps or higher; missile firing positions; air fields; communication centers; logistic centers and critical terrain defiles."⁸⁹ While dual-capable, in practice the role of Army Redstone units in Germany was nuclear fire support. Nuclear warheads were bunkered in a guarded exclusion zone near the missile battery and Artillery Group headquarters.⁹⁰ When tensions with the Soviet

⁸⁴ See Chapter Two, 99, n. 13.

⁸⁵ John C. Lonnquest and David F. Winkler, *To Defend and Deter: The Legacy of the United States Cold War Missile Program*, U.S. Army Construction Engineering Research Laboratories, November 1996, 51.

⁸⁶ *Ibid.*, 51-52.

⁸⁷ Janice E. McKenney, *The Organizational History of Field Artillery, 1775-2003* (Washington, DC: U.S. Army Center of Military History, 2007), 219.

⁸⁸ "Redstone Rocket," U.S. Army Aviation and Missile Life Cycle Management Command, last updated 8/6/21, <https://history.redstone.army.mil/space-redstone.html>.

⁸⁹ Captain George M. Rogers, USA, "Tactical Redstone Employment," *Artillery Trends*, U.S. Army Artillery and Missile School, March 1961, 44.

⁹⁰ Jim Ryan, "My Army Redstone Missile Days: October 1958 to February 1962," undated blog, 6, <http://www.myarmyredstonedays.com/page6.html>. Such first-hand accounts and Redstone unit histories make no mention of conventional warheads being deployed.

Union were high over Berlin in May 1959, Redstone units went on field alert and live nuclear warheads reportedly were brought with them but were not mated to the missiles.⁹¹ Also during 1959, the Army converted Nike Ajax batteries in Europe to the Nike Hercules, adding a nuclear-capable SAM to the protection of allied depots and major bridges over the Rhine.⁹²

The Army's continued investment in attention-grabbing missile systems came at the expense of operational readiness, however:

At the end of May 1958, the Seventh Army reported that, of its forty-nine atomic artillery and missile units twenty-one were considered operationally ready, twenty-two as marginally ready at reduced capability, and six unready. Although technically competent, most units lacked sufficient personnel and were experiencing shortages in essential electronics, spare parts, and communications equipment. The source of these deficiencies was clear. The Army was devoting to research and development funds that might have otherwise gone to eliminating [these shortages]. In his annual historical report, the commander in chief, U.S. Army, Europe, General [Henry I.] Hodes, pointed out that the continuous development of new missile systems made it very difficult to maintain combat readiness on a day-to-day basis.⁹³

Moreover, with the influx of new weapons, the Army education system struggled to keep up with the rising demand for nuclear specialists:

The number of employment officer available was far short of that required to use the increasing numbers of nuclear weapons effectively. Additionally, a high percentage of the officer who had completed the NWECS were not assigned to tactical units or were

⁹¹ Ibid.

⁹² Carter, *op. cit.*, 331.

⁹³ Ibid., 307.

too senior to occupy the personnel positions designated to be filled by trained employment officers...⁹⁴

The extended reach of the new weapons posed training challenges of their own in West Germany. It was difficult to test fire conventional rounds from the huge, 280 mm guns due to a lack of suitable firing ranges.⁹⁵ Moreover, by the middle of 1955:

The Seventh Army had launched only two Honest John rockets, using ranges at Grafenwöhr, the largest U.S. training area in Germany. By the end of the year, USAREUR and U.S. European Command were still negotiating to obtain suitable facilities in Africa where the units could train. As a result, although the addition of rocket- and guided-missile units increased the Seventh Army's options for atomic firepower and helped to diminish its reliance on Air Force-delivered munitions, the lack of firing ranges limited the command's ability to train its soldiers to use and support the weapons.⁹⁶

As an Army major observed, "our employment capability was being impaired seriously because the training program was lagging so far behind weapons availability."⁹⁷ In short, the Army's rapid deployment of nuclear weapons systems outpaced the doctrine, training, and logistics needed to operationalize and sustain them.

The stunning repudiation of the Pentomic division marks the end of this phase of nuclear-conventional synchronization. In a sense, while the Airborne Club lost this battle, it won the war over national strategy, as President Kennedy embraced the concept of "Flexible Response" that Taylor had unsuccessfully advocated under Eisenhower. What Army leadership did not foresee was that this White House endorsement

⁹⁴ Freed, *op. cit.*, 63.

⁹⁵ Carter, *op. cit.*, 213

⁹⁶ *Ibid.*, 217.

⁹⁷ Freed, *op. cit.*, 63.

would come with unprecedented civilian scrutiny and control over the employment of nuclear weapons. This would have far-reaching consequences for Army synchronization of nuclear and conventional nuclear weapons.

3. Reducing Emphasis on Increasing Numbers of Nuclear Weapons (Mid 1960s-Mid 1970s)

In this phase, the shift from “Massive Retaliation” to “Flexible Response” has a disruptive effect on the Army’s synchronization of nuclear and conventional weapons. No longer assured of access to nuclear weapons in a conflict and with the war in Vietnam escalating, Army leaders turn their attention away from tactical nuclear warfare doctrine. What emerges in its place is a politically constrained service policy on nuclear employment and the concept of a “nuclear package.” Despite the Kennedy and Johnson administrations’ emphasis on conventional forces, this phase ironically sees a dramatic increase in the number of tactical nuclear weapons deployed to Europe. Running counter to the tactical nuclear build-up, exercises de-emphasize nuclear weapons, and internal criticisms are voiced about the lack of realism, particularly in nuclear unit inspections. The phase ends with little progress in nuclear-conventional synchronization.

Scholars of the period agree that Flexible Response had a negative effect on the Army’s development of tactical nuclear doctrine:

Kennedy’s “flexible response” military policy caused the Army to focus on fighting conventional or non-nuclear battles and obscured the need for a fully developed tactical nuclear doctrine. As a result the development of Army tactical nuclear doctrine stalled.⁹⁸

Through the early and mid-1960s, Army tactical nuclear thought went into remission.... FM 100-30 (1951) remained the most

⁹⁸ Rose, *op. cit.*, 76..

thorough and "current" unclassified guidance available in the Army field manual library.⁹⁹

The adoption of "Flexible Response" cooled Army enthusiasm for developing a workable doctrine for operations on a nuclear battlefield.

After the 1962 release of FM 61-100, The Division, which was criticized internally for paying only "lip service" to nuclear

firepower,¹⁰⁰ the Army's FM series neglected tactical nuclear weapons for years. When it re-engaged later in the decade, little new thinking was evident. In 1968, the Army released FM 101-31-1, Nuclear Weapons Employment Doctrine and Procedures. It continued to reflect 1950s thinking. For instance, blast remained the primary kill mechanism for most nuclear weapons. Critical trade-offs between conventional and nuclear postures remained unresolved:

[Unit] separation distances were based on the "maximum assumed enemy nuclear threat." For a 10 kiloton weapon, the separation between companies would be 2,300 to 3,300 meters. Maneuver companies separated by such distances are vulnerable to piecemeal defeat while large size threat forces can easily infiltrate the gaps... the task of transition to a dispersed posture by Army ground combat units would appear difficult if not impossible¹⁰¹

In 1971, the Army published an interim manual, FM 100-30 (TEST), *Tactical Nuclear Operations*. Echoing themes of the 1950s, the key to battlefield success would lie in dispersion, mobility, superior intelligence, and communications. It continued to base doctrine on the unconstrained use of nuclear weapons in order to destroy the enemy's capability to wage war. It was up to the corps to control the selective employment of individual weapons on specific targets. Maneuver forces were to acquire

⁹⁹ Maiorano, *op. cit.*, 94-95.

¹⁰⁰ Lieutenant Colonel Lawrence M. Jones, USA, "Do We Have a Workable Doctrine for Nuclear Warfare?" *Military Review* 42, no. 7 (July 1962): 9.

¹⁰¹ Rose, *op. cit.*, 177.

and develop targets for nuclear weapons and to exploit their effects. Destruction of the enemy nuclear delivery means was seen as a principal objective. Assigned areas of responsibility were greater than ever before envisioned on the battlefield. In 1958, the corps defended an area 50 km wide and 75 km deep; in 1971 that was doubled to 100-150 km wide and 150 km deep.¹⁰² The manual anticipated that tactical nuclear war was going to be short with decisive battles lasting maybe hours instead of days, and the entire span of a tactical nuclear war probably not exceeding 120 days.¹⁰³

Political concerns voiced during the Kennedy Administration began to creep into FM 100-30 (TEST). Gone was the assumption that a strategic nuclear exchange would precede theater nuclear use. It “spoke of a complex transition from conventional to nuclear operations in which ‘the combatants must practice some degree of arms control and must refrain from actions that encourage escalation.’ While the older FM 100-31 adopted a war-fighting position with credible use of nuclear weapons, FM 100-30 (Test) was more concerned with the political difficulties of employment.”¹⁰⁴

As one Army scholar put it:

FM 100-30 (TEST) represented more of a philosophy on future wars than a tactical doctrine on how to fight and win that war. The manual neglected to present an organized body of tactical warfighting doctrine for the nuclear battlefield. It failed to teach how the Army must fight, survive, and accomplish the mission (win) when faced with combat in a tactical nuclear environment. The manual was characterized by vague generalities and considerations and thus left much to be interpreted rather than practiced and tested.¹⁰⁵

Bringing Army thinking further into alignment with Flexible Response and NATO’s recently agreed political guidelines for the initial tactical use of nuclear weapons, Chief of Staff General Creighton Abrams issued in

¹⁰² Ibid., 99-105.

¹⁰³ Ibid., 103-106, 170.

¹⁰⁴ Maiorano, *op. cit.*, 115.

¹⁰⁵ Ibid., 106.

May 1973 a “Deployment and Employment Policy for Tactical Nuclear Weapons.” The new policy marked the end of unconstrained use of nuclear weapons for the Army. As opposed to defeating enemy forces, the main purpose of nuclear weapons use was now to control conflict

Should deterrence fail, the objective of tactical nuclear operations would be to increase the probability of early conflict termination. Nuclear weapons should be utilized in a manner to demonstrate U.S. resolve and to make clear to the enemy that should aggression continue we have available a range of options that can inflict additional damage on targets that he values, while at the same time signaling our willingness to bring hostilities to an end without further escalation. This requires that we attack targets threatening us and our allies, but also that we withhold against targets of value to him to make the point that we are capable of inflicting additional damage.... Essential to such nuclear operations are, on the one hand, clear and persuasive diplomatic opportunities to negotiate and/or terminate the hostilities and, on the other hand, a credible ability and willingness to respond to repeated or escalated attacks by drawing appropriately from a continuum of force capability.¹⁰⁶

The Army put little stock in nuclear employment beneath the pulse level. Yet, arguably, that is where escalation risks would have been more manageable.

The new policy identifies five possible tactical nuclear use options, each assessed for political-military utility and escalation potential, as summarized in Table 2.

Above all, the emphasis was on scaling nuclear use to limited political objectives. One means of doing so would be to confine a nuclear strike to a very short period of time with a clear termination point, “so that the enemy could perceive that the strike objectives were limited...A single salvo or ‘pulse’ would appear to be the best strike mode insofar as it is technically and militarily feasible.”¹⁰⁷ The newly established U.S. Army Training and Doctrine Command

¹⁰⁶ *Deployment and Employment Policy for Tactical Nuclear Weapons*, Headquarters, Department of the Army, April 25, 1973, 38-39. Declassified.

¹⁰⁷ *Ibid.*, 33.

(TRADOC), along with the U.S. Army Nuclear and Chemical Agency (USANCA) and the Nuclear Doctrine, Organization, and Equipment (NUDORE) study team at CGSC, would further develop these broad concepts and policies into content suitable for field manuals¹⁰⁸

The results emerged in the July 1976 Field Manual 100-5, Operations. Capstone of the Army's manual series, FM 100-5 observed that, "the pendulum has swung from conventional war to nuclear war and now to the present concept of conventional-nuclear war,"¹⁰⁹ but did not explain that concept. Indeed, across roughly twelve chapters on various aspects of conventional warfare, FM 100-5 made no mention of tactical nuclear operations. That subject was confined to a single chapter toward the end, which was limited to nuclear weapons effects, release controls, and

At times, the personal views of TRADOC leadership impeded development of Army doctrine for the nuclear battlefield.

principles of fire planning. The segregation and demotion of nuclear content in FM 100-5 reflects the views of TRADOC Commander General William DePuy, who personally resisted

the notion of theater nuclear combat and did not want to upset the West German military, which was equally opposed to tactical nuclear warfighting¹¹⁰ Accordingly, the manual assumed that a Soviet/Warsaw Pact attack would be non-nuclear despite fervent debate in the U.S. defense community that the Soviet Union would limit itself so.¹¹¹ FM 100-5 set back efforts to build an integrated doctrine.

¹⁰⁸ Karl E. Cocke, *Department of the Army Historical Summary, FY 1974*, Center of Military History, U.S. Army, 1978, 12, <https://history.army.mil/books/DAHSUM/1974/ch02.htm#b7>. See also, Rose, *op. cit.*, 106-107.

¹⁰⁹ Headquarters, Department of the Army, Field Manual (FM) 100-5, *Operations*, 1 July 1976, 2-28. Hereafter FM 100-5 (1976).

¹¹⁰ Major Paul H. Herbert, USA, "Deciding What Has to Be Done: General William E. DePuy and the 1976 Edition of FM 100-5, Operations," *Leavenworth Papers*, No. 16, July 1988, 90-91.

¹¹¹ See, for example, Jeffrey Record, *U.S. Nuclear Weapons in Europe: Issues and Alternatives* (Washington, DC: The Brookings Institution, 1974), 37-44; William R. Van Cleave and S.T. Cohen, *Tactical Nuclear Weapons: An Examination of the Issues* (New York: Crane Russak, 1978), 63-75; and Rose, *op. cit.*, 129-157.

Tactical Nuclear Use Option	Description	Target(s)	Political Utility	Military Utility	Escalation Potential
Demonstration	Lowest level of initial use of tactical nuclear weapons, a demonstration by a limited number of such weapons	• Detonations that seek no target damage, or: • Nuclear-armed SAM vs. enemy aircraft over allied territory • Nuclear munition vs. enemy submarine	Uncertain	Very doubtful	As threat posed to enemy forces increases, especially to their means of retaliating, so may the pressure on the enemy to escalate with his nuclear forces
Limited Defensive Use	Achieve a more meaningful military effect than a demonstration	• Probably confined within allied territory • Perhaps nuclear-armed SAM over non-Soviet Warsaw Pact territory	May be disruptive within NATO	Little military advantage over conventional alternatives	Emphasizes the escalation boundary by confining use over allied territory or international waters
Restricted Battle Area Use	Inflicts sufficient damage in conjunction with conventional operations to prevent enemy forward elements from attaining their objectives	• A single salvo or "pulse" vs. enemy forces in contact plus forward echelon reserves and directly associated nuclear delivery systems • Respect political boundaries • Avoid destruction of enemy's control over his nuclear forces	Offers potential for early conflict termination	Emphasizes military effectiveness	Recognizes escalation boundaries and political controls

Table 2a. : U.S. Army Tactical Nuclear Use Options, 1973.¹¹²

Tactical Nuclear Use Option	Description	Target(s)	Political Utility	Military Utility	Escalation Potential
Extended Battle Area Use	Use beyond the immediate battle area, minus the homelands of major nuclear powers, to alter the military situation	• Highly selective targeting of 1st & 2nd echelon forces, plus surface-to-surface missiles, airfields & supply facilities in satellite countries • Avoid cities	Selectivity makes this attractive to NATO allies	Alleviates an immediate crisis situation	Caution must be exercised so that enemy does not miscalculate intent & escalate
Theater Wide Use	Highest level of nuclear war short of general nuclear response. Neutralize threat in theater & seize initiative to force conflict termination. Could be reinforced by selected portions of the strategic nuclear force	• Enemy forces • Deep interdiction targets • IRBMs deployed on the enemy's frontier	Decision to invoke probably will be withheld until no lesser nuclear or conventional option will suffice	Alleviates an immediate crisis situation	Considerable incentive for the enemy to escalate to an even more intense nuclear war

Table 2b. : U.S. Army Tactical Nuclear Use Options, 1973.¹¹²

¹¹² Table derived by author from *Deployment and Employment Policy for Tactical Nuclear Weapons*, *op. cit.*

It thus fell to other manuals to explain the concept of conventional-nuclear operations.¹¹³ In essence, the term meant, “The division must be prepared to conduct conventional and nuclear operations *concurrently*.”¹¹⁴ This carried geographic implications. For instance, “When in contact [with Warsaw Pact ground forces]...the division should expect the preponderant forward threat will be from conventional attack. The incidence of nuclear attack...should be greater in the rear areas of forward brigades and in the division’s rear defense area [because] it is at distances beyond the range that direct fire weapons are being used that nuclear weapons cause best results with fewest risks to the user.”¹¹⁵

To attain conventional-nuclear concurrency, the Army chose to divide the labor among levels of command. In essence, nuclear employment was the concern of corps and divisions, which had organic nuclear-capable artillery, whereas brigades, which lacked such capability, would focus on the conventional fight

The division requires simultaneous capabilities to conduct conventional defensive operations and to deliver controlled nuclear fires. This dual capacity is achieved by a functional shift that allows brigades to execute the conventional defense and allows division artillery to focus on support of the corps in the planning and execution of nuclear strikes. Division coordinates and integrates the conventional defense with the nuclear operations... the brigades execute the division’s conventional defense.¹¹⁶

¹¹³ The lineage of this new doctrine beginning in 1973 is explained in U.S. Army Command and General Staff College Reference Book (RB) 100-30, Vol I, *Conventional-Nuclear Operations*, 6 August 1976, 2-3. Hereafter RB 100-30, Vol I (1976).

¹¹⁴ Draft chapter of FM 71-100, *Armored and Mechanized Division Operations*, appended in RB 100-30, Vol I (1976), 122. Emphasis added.

¹¹⁵ Ibid.

¹¹⁶ Ibid., 125-126.

The notion that nuclear operations were a problem for brigade-level command and higher likely reinforced the “nuclear allergy” of the Army’s rank and file.

Or, as expressed in terms of command echelons:¹¹⁷

- *Generals (i.e., corps and division commanders) control the rate and timing of the concentration of maneuver forces, and concentrate nuclear firepower;*
- *Colonels (i.e., brigade and battalion commanders) prioritize*

local areas for nuclear weapon employment, and adjust unit areas and dispositions to it; and,

- *Captains (i.e., company commanders) provide nuclear essential elements of information (EEI) that generals use to request nuclear packages, apply a nuclear mission-oriented protective posture (MOPP) as directed, and fight the conventional battle in a nuclear environment.*

In short, it is generals and colonels, “who integrate conventional and nuclear considerations and functions and really make the operations ‘conventional-nuclear.’”¹¹⁸

To operationalize the transition of doctrine from unconstrained to limited nuclear use, FM 100-5 and FM 100-5-1, *Conventional Nuclear Operations*, which followed it in November, introduced the concept of the nuclear package: “a group of nuclear weapons of *specific yields* for employment in a *specified area*, within a *limited timeframe* to support a *tactical contingency*.”¹¹⁹ The nuclear package was an attempt to reconcile inherently contradictory imperatives – tight political control over nuclear use and reliable, responsive firepower. Crucially:

The package will be planned for employment in a timeframe, normally expressed in hours, to insure full integration with other military and diplomatic actions. Within the specific timeframe, all nuclear weapons will be employed as a “pulse” within a shorter timespan, normally expressed in minutes. The timespan for the

¹¹⁷ Adapted from RB 100-30, Vol I (1976), 91.

¹¹⁸ Ibid., 90.

¹¹⁹ FM 100-5 (1976), 10-7. Emphasis in the original.

pulse of nuclear weapons will depend on the technical capability for proper command and control, warning, tactical flexibility, operational necessity, and national approval. Continuous updating and refinement of packages is essential if they are to be employed effectively within the timespan approved or directed by the releasing authority.¹²⁰

The employment of 100-200 tactical nuclear weapons by a U.S. corps in a 45- to 90-minute pulse would hardly look selective to the Soviets, particularly as it was unfolding.

A typical corps “package” consisted of between 100 and 200 tactical nuclear weapons, amounting to some 300 kt apportioned among 155 mm and 8-inch cannons, theater support missiles, man-portable atomic demolition munitions

(ADMs), and gravity bombs delivered by tactical aircraft.¹²¹ Multiple corps packages could exist but the inherent complications in planning and maintaining them meant that in practice only one was developed. In essence, the corps commander had to anticipate which types of nuclear weapons would be needed in what quantities and delivery means for multiple contingencies. To make clear to the Soviet Union that it was a limited theater strike, weapons in the package had to be fired in a single 45- to 90-minute window.¹²² It was an immense planning burden unique to U.S. ground forces.¹²³

Making matters worse was the time lag that would accompany a corps commander’s request for release of a nuclear package. As graphically depicted in FM 100-5, it could take up to 21 hours before a corps commander’s request to use nuclear weapons was approved and implemented (see Figure 3). Moreover, the corps commander needed exquisite timing in that he could only request release of a nuclear package

¹²⁰ Ibid., 10-7/8.

¹²¹ RB 100-30, Vol I (1976), 36-39.

¹²² Ibid., 26.

¹²³ The U.S. Marine Corps also subscribed to the nuclear package concept and procedures. Army Field Manual FM 100-31-1, *Nuclear Weapons Employment Doctrine and Procedures*, March 1977, hereafter FM 101-31-1 (1977), was also released under the same title as Marine Corps Fleet Marine Force Manual (FMFM) 11-4.

when defeat seemed imminent, yet he retained sufficient forces to conduct a conventional forward defense against whatever enemy forces remained after the nuclear strike. It was recommended that he assess this pivotal point 14 to 18 hours before it was to occur.¹²⁴ The elaborate and exacting processes governing the nuclear package could have but two effects on corps commanders – to encourage them to request a nuclear package “within hours if not minutes after the attack begins,”¹²⁵ and to use all of the weapons in the package during the resulting “pulse,” since the prospects of future approvals were so uncertain.¹²⁶ A third possibility was to conclude that the Army was not serious about tactical nuclear warfare.¹²⁷

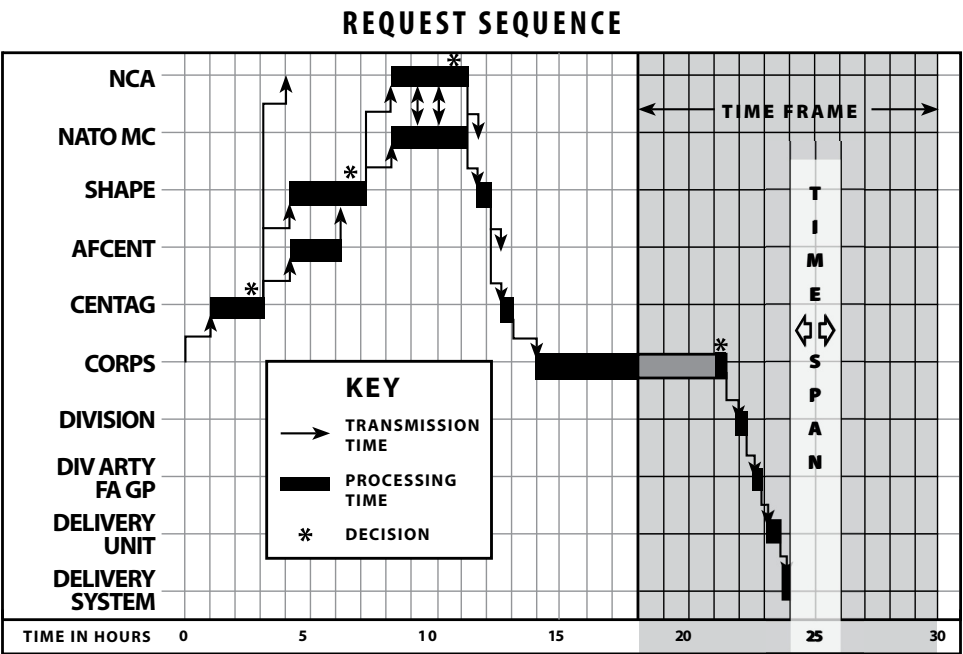


Figure 3: Nuclear package request sequence, FM 100-5 (1976)

¹²⁴ RB 100-30, Vol I (1976), 46.

¹²⁵ Rose, *op. cit.*, 172.

¹²⁶ Indeed, there was a presumption in Army field manuals that the entire nuclear package would be expended. See, for example, RB 100-30, Vol I (1976), 115.

¹²⁷ As one critic observed, “the nuclear weapon package could only have been effective if the Soviet’s [*sic*] attack was slow, conventional and conformed to prehostility planning conceptions. In reality, the package was structured more to fit the West German [Army’s] conception of ‘political application’ [of nuclear weapons] than to impart any military utility to the weapons.” Maiorano, *op. cit.*, 122-123.

As one military scholar assessed:

The ten-year phase of tactical nuclear doctrine development, extending from 1968 to 1977, was thus a dismal failure. Compared with the aggressive doctrine of the 1950s, tactical nuclear doctrine in 1977 was less integrated into the overall NATO defense structure. Hastening conflict termination, referring to some sort of return to a status quo ante, and not victory became one of the primary functions of tactical nuclear weapons.¹²⁸

In reality, the premise of Army tactical nuclear weaponry had changed, and predictably so. Several U.S. Army studies between 1955 and 1958, as well as British and West German studies in the 1960s, showed that once the Soviet Union also equipped its forces with tactical nuclear weapons, their employment by the West would be disadvantageous.¹²⁹ Consequently, as the U.S. Congressional Budget Office concluded in 1977, “the most important function of NATO theater nuclear forces has become the deterrence of a Soviet first use of nuclear weapons in Europe.”¹³⁰

In terms of force posture, this period was marked by tremendous growth in the number of theater nuclear forces (TNF) – at a time when the White House and Army were moving to de-emphasize nuclear combat. This underscored the extent to which Army doctrine and procurement had become uncoupled.

In September 1966, Secretary of Defense Robert McNamara announced that there were 7,000 U.S. nuclear weapons stockpiled in Europe, double the number deployed in 1961.¹³¹ According to senior officials at the time, this growth was less the result of deliberate planning than political trade-offs:

¹²⁸ Ibid., 123.

¹²⁹ Heisenberg, *op. cit.*

¹³⁰ “Planning U.S. General Purpose Forces: The Theater Nuclear Forces,” *Budget Issue Paper*, Congressional Budget Office, January 1977, 39

¹³¹ Robert C. Doty, “7,000 Warheads in NATO’s Forces: McNamara Says Number Has Doubled in 5 Years,” *New York Times*, September 23, 1966.

Paul Nitze [Deputy Secretary of Defense, 1967-1969] said that Secretary of Defense McNamara allowed the TNF stockpile in Europe to increase during the 1960s because the Secretary had so many other battles (above all, the Vietnam War) on his hands, and he was led into inconsistencies that he found almost impossible to resolve. There was no persuasive answer on the utility of employing TNF in actual operations if war broke out or on whether TNF use could be separated from strategic force employment; but some U.S. military leaders and European allies believed that the TNF had a deterrent effect, and it was easier to leave the TNF programs alone than to try to change them. Thus some decisions were made not on the basis of studies, but because of practical political and bureaucratic constraints.

As Henry Rowen [RAND Corporation President, 1967-1972] has written on the same subject, “the Europeans were suspicious of U.S. motivations in emphasizing non-nuclear forces and, more importantly, they were unwilling to spend money to upgrade their conventional forces.... A change in policy to hold down or to reverse the flow of U.S. nuclear weapons to Europe would have been held by some to signal a dangerous reduction in U.S. commitment to Europe's defense.... Although the JCS did not have a sound basis for proposing the continued build-up of nuclear weapons in Europe, Secretary McNamara was not armed with powerful arguments to oppose it. He went along with the increases because he did not think that increasing tactical nuclear weapons made much of a difference one way or another and saw no good grounds for making trouble with the JCS and the Europeans on this issue.”¹³²

While Secretary McNamara chose not to oppose an increase in TNF, he did act to cap it. Much as he had been wrestling with the Air Force to establish a ceiling on SAC bombers and ICBMs, McNamara arbitrarily established 7,000 as the upper limit of tactical nuclear warheads for the European theater.¹³³

¹³² David S. Yost, “The History of NATO Theater Nuclear Force Policy: Key Findings from the Sandia Conference,” *Journal of Strategic Studies* 15, no. 2 (June 1992): 242-243.

¹³³ J. Michael Legge, *Theater Nuclear Weapons and the NATO Strategy of Flexible Response*, RAND, April 1983, 86.

Helping to inflate these numbers were earlier decisions to equip and train certain European NATO allies to deliver U.S. tactical nuclear weapons in the event of war. As Secretary of Defense James Schlesinger revealed to Congress in 1975, the United States had nuclear Programs of Cooperation with seven NATO allies to make nuclear weapons available for their 155 mm and 8-inch cannons; Honest John, Sergeant, and Pershing missiles; Nike Hercules SAMs; tactical aircraft; and anti-submarine delivery systems.¹³⁴ “The Army also deployed some five thousand soldiers to Europe in July 1960 to serve as custodians and guards for the atomic shells and warheads set aside for NATO. Those same soldiers were trained to assist allied personnel in assembling and launching the weapons.”¹³⁵

This was also the tail end of the Army’s drive to integrate nuclear weapons throughout its force structure, symbolized by the 1961 fielding of the Davy Crockett, a very short-ranged nuclear projectile for use by infantry battalions and reconnaissance squadrons. Incredibly, the roughly one- to two-mile range of the Davy Crockett left the crew exposed to both its nuclear blast and radiation effects. Nonetheless, the weapon was not withdrawn from West Germany until 1967, as atomic shells became available for the Army’s standard 155 mm howitzer.¹³⁶

During this phase, the Army fielded two new missile systems, the aforementioned Pershing and the Lance. The Pershing was a solid-fueled, intermediate-range replacement for the Redstone missile. The Lance was a shorter-range missile that would replace the Honest John rocket and Sergeant ballistic missile on a one-for-two basis. Both Pershing and Lance were dual-capable.

Shortly after the Pershing was deployed to West Germany in 1963, the Supreme Allied Commander Europe (SACEUR) began searching for

¹³⁴ Secretary of Defense James R. Schlesinger, *The Theater Nuclear Force Posture in Europe: A Report to the United States Congress in compliance with Public Law 93-365*, April 1, 1975, 9-10. Declassified

¹³⁵ Carter, *op. cit.*, 434. A major initiative of the Kennedy Administration was to ensure that these weapons had locks, so-called permissive action links (PALs), which prevented their use without presidential authorization. As Schlesinger noted in his April 1975 report to Congress, “...all U.S. nuclear weapons deployed in Europe are locked with coded devices.” Schlesinger, *op. cit.*, 11.

¹³⁶ Carter, *op. cit.*, 442, 449.

The Army's Pershing Ia missile enabled some tactical aircraft to be re-assigned from nuclear to conventional missions – an under-appreciated case of inter-service conventional-nuclear balancing.

a way to augment forces available to strike the growing number of priority targets deep in Warsaw Pact territory as part of his General (i.e., nuclear) Strike Plan, or GSP. Also at this time, Secretary McNamara

was looking for ways to increase the survivability of U.S. TNF. After tests in 1965, the more mobile Pershing was selected to replace the Air Force's Mace cruise missile, which was tied to fixed launchers on air bases in West Germany.¹³⁷ Changes were made to the Pershing to improve its reaction time, resulting in the Pershing Ia. Its deployment was then increased from 12 to 108 launchers to better meet SACEUR's Quick Reaction Alert (QRA) needs under the GSP. The boost in Pershing Ia launchers also freed some tactical aircraft from QRA, enabling them to be re-assigned to conventional missions.¹³⁸ This was an important Army contribution to nuclear-conventional synchronization. From the Army's perspective, selection of the Pershing Ia for QRA had given the service a "strategic" nuclear mission, its first since shedding the Manhattan Project and the Army Air Force in the late-1940s.¹³⁹

There was a critical trade-off for USAREUR with the elevation of the Pershing to the QRA mission, however. Whereas the Redstone had been a general support (GS) nuclear system for the Seventh Army, the Pershing was only available to it on a secondary basis, after SACEUR's needs were met. In other words:

¹³⁷ Lieutenant Colonel Randall L. Lanning, USAF, *United States Air Force Ground Launched Cruise Missiles: A Study in Technology, Concepts, and Deterrence*, Air War College Research Report, Air University, United States Air Force, Maxwell Air Force Base, Alabama, 1992, 26.

¹³⁸ Major Alan L. Moore, Jr., USA, "Pershing – A Weapon for Long-Range Fire Support," *Field Artillery Journal* 45, no. 3 (May-June 1977): 27. As of the late-1970s, DoD had not disclosed the number of aircraft thus freed for conventional missions. See "Planning U.S. General Purpose Forces: The Theater Nuclear Forces," *op. cit.*, 35, n. 5.

¹³⁹ Major Robert J. Baker, USA, "Pershing – The Ultimate Challenge," *Field Artillery Journal* 45, no. 3 (May-June 1977): 10. Recall that while the Army developed and built the Jupiter IRBM, it was operated by the Air Force.

During the critical, early phase of a potential conflict in central Europe, the army and corps commanders now have only cannon artillery and the Lance battalions as organic fire support means, immediately responsive to their requirements. Those targets in the commander's zone of primary interest beyond the range of the Lance missile can only be attacked with tactical aircraft sorties allocated by SACEUR. The commander has lost his organic, long-range, GS nuclear firepower until after Pershing fire on its GSP targets. There is also the possibility that SACEUR might retain Pershing for restrike or other priority targets in the post-GSP phase.¹⁴⁰

Moreover, because of the Lance replacement ratio, there were now one-third fewer short-range missile launchers available, and Lance was not able to engage moving targets.¹⁴¹

In the mid-1960s, the Army made one last effort to devise a workable force structure for the nuclear battlefield. Under the code name "Oregon Trail," CONARC conducted an eighteen-month study of the ROAD division and found it poorly suited to conventional-nuclear combat:

[T]he ROAD force, if conventionally employed, would suffer more than 40 percent casualties in the first 30 days of a two-sided nuclear campaign...whenever the ROAD [division] concentrated sufficiently to conduct successful conventional operations, it offered lucrative nuclear targets which produced massive losses...when the ROAD-type force dispersed to avoid nuclear strikes, the units could be defeated by conventional tactics.¹⁴²

As a retired field artillery officer observed, the Oregon Trail findings were nearly identical to the Army War College's PENTANA study, which:

¹⁴⁰ Ibid.

¹⁴¹ Lieutenant Colonel Wilson A. Shoffner, USA, "The Time Has Come," *Field Artillery Journal* 44, no. 1 (January-February 1976): 46, 50.

¹⁴² Quoted in Colonel (ret.) David O. Smith, USA FA FAO, "The U.S. Experience with Tactical Nuclear Weapons: Lessons for South Asia," Stimson Center, March 4, 2013, 17.

...called for the employment of smaller combat units organized in depth to destroy enemy forces by indirect nuclear fires. A major difference, however, was that unlike the earlier study, Oregon Trail employed the quantitative modeling formulas so favored by McNamara's civilian experts, as well as nuclear effects data gleaned from nearly two decades of testing and years of unit performance information. Its conclusions seemed irrefutable.¹⁴³

By setting aside the findings of the Oregon Trail study in the mid-1960s, the Army simply stopped trying to adapt force structure to the nuclear battlefield.

The Army's Assistant Chief of Staff for Force Development, Lieutenant General Theodore Conway, set up a board to review the Oregon Trail findings. The so-called Conway Board

acknowledged the tensions between conventional and nuclear operations but nonetheless recommended retention of the ROAD model. This ensured that the Oregon Trail results would have no direct influence on the Army.¹⁴⁴ Henceforth, the service would simply pretend that the strains between nuclear and non-nuclear operations did not exist.¹⁴⁵

At the same time, the Conway Board recommended enhancing the Army's nuclear arsenal. Apparently, the thinking was that a more robust nuclear capability would deter the Soviets from putting the ROAD divisions to the test of conventional-nuclear combat. This may well demarcate when Army leadership decided that the deterrence role of tactical nuclear weapons superseded their warfighting role.¹⁴⁶ Consequently, the Army came "to view the nuclear battlefield as an abstraction useful in justifying (tactical nuclear) weapon procurement, but not requiring fundamental changes in force design or doctrine."¹⁴⁷

¹⁴³ Ibid.

¹⁴⁴ Yost, *op. cit.*, 242. Yost notes that the Vietnam War also diminished top-level Army interest in the Oregon Trail proposals.

¹⁴⁵ Smith, *op. cit.*, 18.

¹⁴⁶ Skelton, *op. cit.*, 22.

¹⁴⁷ Ibid., 23, quoting John J. Midgely, *Deadly Illusion: Army Policy for the Nuclear Battlefield* (Boulder, CO: Westview Press, 1986).

For the Army education and training community, the shift in focus away from tactical nuclear warfare was swift. Already by 1961,

The curriculum of the Army's Senior Office Nuclear Weapon Employment Course was revamped and the course retitled the Senior Advanced Operations Course. The CGSC Department of Nuclear Weapons briefly became the Department of Special Weapons before being abolished in 1962. Compared with the 614 annual hours of nuclear weapon instruction in 1957-1958, the CGSC curriculum contained 33 hours of such instruction in 1962, 21 hours in 1966, and only 16 hours after 1967.¹⁴⁸

By 1973, CGSC instruction treated nuclear environments as the exception rather than the rule, reversing the standard it had set in 1956.¹⁴⁹

The precipitous schoolhouse drop in nuclear interest during this time was mirrored by the Army's broader thought leadership community. Its attention quickly became focused on various aspects of unconventional warfare. This trend reflected the Army's deepening involvement in the Vietnam War. As reflected in the pages of *Military Review*, from June 1961 through 1970, there were five times more essays on unconventional warfare than on nuclear combat.¹⁵⁰ Of the latter, most continued to grapple with how the Army should fight and survive in a nuclear environment. A minority were focused on the political issues associated with nuclear employment. It was even suggested that the armed forces now existed solely to deter war rather than fight and win it.¹⁵¹

Field exercises also de-emphasized nuclear employment. The decline occurred quickly, even for Seventh Army in West Germany. In August 1960, the 24th Infantry Division held Exercise SUMMER SHIELD in Bavaria. Reflecting the changes in policy and doctrine that were emerging at higher levels, the maneuver scenario featured the use of some atomic weapons, "but such elements were, by then, beginning to diminish

¹⁴⁸ Maiorano, *op. cit.*, 91.

¹⁴⁹ Rose, *op. cit.*, 98.

¹⁵⁰ *Ibid.*, 77-78.

¹⁵¹ *Ibid.*, 77.

in frequency and in emphasis because units were more focused on conventional tactics and operations.”¹⁵²

Declining interest in nuclear exercises also stemmed from an overall lack of workable doctrine and realism. Problems were evident as early as 1958. That year’s command post exercise BOUNCE BACK:

...depicted an initial aggressor strike employing forty-nine separate atomic warheads with yields ranging from 5 to 100 kilotons against NATO military installations. Observers noted that after the strike it was difficult to generate a sense of realism for the exercise’s participants. What had started in the early 1950s as an honest attempt to portray and understand the realities of atomic warfare had, by 1958, come to resemble the plot of a Hollywood science fiction thriller. As the exercise demonstrated, the idea of a doctrine based on atomic weapons had grown increasingly abstract because much of the effort seemed to involve mathematical calculations of how much of the force would remain after the initial strikes. Evaluators noted in their reports that personnel no longer seemed to be taking the training seriously.¹⁵³

The situation did not get any better in the 1960s. For instance, field training exercise WINTERSHIELD in Bavaria in February 1961 “was carefully controlled and unrealistic in the nuclear simulation, in the interest of training efficiency. To keep the exercise moving, all effects and nuclear casualties were erased after 6 hours.”¹⁵⁴

WINTERSHIELD also called attention to a problem that was plaguing the Army: “The most immediate problem arising from the exercise was the realization that there was neither doctrine nor stated policy for guidance on nuclear target designation and that too much time was lost in obtaining authority to fire.”¹⁵⁵ The need for greater realism in nuclear target acquisition in field exercises continued to be voiced by Army officers

¹⁵² Carter, *op. cit.*, 453.

¹⁵³ *Ibid.*, 311.

¹⁵⁴ Trauschweizer, *op. cit.*, 99-100.

¹⁵⁵ *Ibid.*, 100.

years later.¹⁵⁶ The heart of the problem was two-fold: authority to employ nuclear weapons rested with the President, and the Army's approach to nuclear targeting was laborious and time-consuming. The latter not only inhibited nuclear-conventional synchronization but also suggested that in the heat of battle, nuclear targeting would devolve into guesswork. As instructors at the U.S. Army Artillery and Missile School observed in 1960:

...the present method of numerical nuclear target analysis is too time consuming because of the many mathematical computations. The simplified method of target analysis at best is an "educated guess" and is inaccurate, since it does not consider all delivery errors.

Nuclear fire planning must be completed prior to nonnuclear fire planning so that the two plans may be integrated. For maximum utilization of artillery, the nuclear and nonnuclear fire plans must be integrated to achieve maximum efficiency. In the present manual solution of fire planning, very little integration of fires is accomplished because of time limitations.¹⁵⁷

For the instructors, the answer lay in emerging technology:

Automatic data processing (ADP) and computers are essential to give us more accuracy and greater speed in the employment of nuclear weapons. The computer can solve in minutes a problem that now takes the nuclear weapons employment officer (NWEO) hours to solve in nuclear fire planning.... With ADP, complete integration of the two fire plans will become a reality.¹⁵⁸

The introduction of computers notwithstanding, the nuclear targeting process had yet to strike the right balance between complexity and timeliness by the mid-1970s, as a field artillery office observed:

¹⁵⁶ See, for example, Lieutenant Colonel Lawrence M. Jones, USA, "G2: Key to Nuclear Target Acquisition," *Military Review* 43, no. 8 (August 1963): 69-70.

¹⁵⁷ "Speeding Nuclear Response Via ADP," *Artillery Trends*, U.S. Army Artillery and Missile School, September 1960, 59-60.

¹⁵⁸ Ibid.

Army nuclear fire planning deficiencies never appeared to be satisfactorily resolved before the end of the Cold War.

...the [division commander might emphasize faster and simpler means for developing and analyzing nuclear targets. Prompt warning orders and "ball park" figure are more valuable than detailed analyses of incomplete or changing data. Techniques should

be reoriented to provide the commander with a reasonably accurate body of information upon which he can make a prompt decision. Target analysis would continue until expenditure of the weapon or cancellation of the mission. The commander would be notified at any point that new information indicated a conflict with command criteria for troop safety, damage preclusion, effect on target and so forth.¹⁵⁹

Other Army stalwarts continued to work through the myriad challenges of operationalizing nuclear employment procedures during this period. One officer wrote of the need to train *all* Army officer in nuclear weapons use:

...all officer assigned to a battle group or larger unit staff should be trained to employ nuclear weapons effectively. To meet this requirement, it is believed the training program of the future must have as its underlying objective the training of all officer in the essentials of nuclear weapons employment. This instruction should be regarded as a normal and necessary part of the officer's professional education, not a special subject for relatively few of the officers.¹⁶⁰

Some progress toward service-wide nuclear education came with the Army Forces Command's decision in 1973 to require that Army Reserve components undergo nuclear training.¹⁶¹

¹⁵⁹ Captain Peter M. Ossorio, USA FA, "From Aachen to Zwolle," *Field Artillery Journal* 43, no. 6 (November-December 1975): 12-13.

¹⁶⁰ Freed, *op. cit.*, 64.

¹⁶¹ "147th Goes Nuclear," *Field Artillery Journal* 44, no. 1 (January-February 1976): 56.

Army officers also became increasingly vocal in the 1970s about the lack of realism and distorting impacts of the service's Technical Proficiency Inspections (TPIs). Back in 1956, the Army assumed responsibility from the AFSWP for conducting TPIs of its units that stored, maintained, transported, and fired nuclear weapons.¹⁶² The roughly annual inspections, carried out by the Army Inspector General's Office, were exacting and resulted in either a satisfactory (SAT) or unsatisfactory (UNSAT) rating.¹⁶³ The inspections were not conducted under realistic field conditions, yet because no commander wanted an UNSAT rating on his record, a unit's training schedule would be dominated by rehearsals designed solely to pass a TPI. In 1972, the Army Inspector General himself acknowledged, "The readiness of [nuclear] units to perform their wartime function cannot be measured, much less improved, until the technical operations are conducted in a realistic and timely manner," and that, "How to assure realism during TPI's has been the subject of considerable soul-searching by my office for the last several years."¹⁶⁴ The Inspector General noted that his office was seeking ways to simplify technical operation procedures and inspections consistent with reliability. At a senior field artillery commanders conference held in 1976 (only the third such meeting since 1946), a key topic discussed was how to evaluate the nuclear surety preparedness of a unit in a more meaningful way.¹⁶⁵

By the mid-1970s, Army nuclear-conventional synchronization thus was in disarray. The number of U.S. tactical nuclear weapons in Europe increased 100 percent under an administration determined to reduce the Army's reliance on them. Development of an integrated doctrine for conventional-nuclear operations stalled due to opposition by TRADOC leadership. In the field internal criticism mounted over an unrealistic and burdensome nuclear inspection process for Army units tasked and equipped for nuclear

¹⁶² William M. Donnelly, *Army Readiness Reporting Systems, 1945-2003*, U.S. Army Center of Military History, 2018, 37.

¹⁶³ See the Army's own training film on the subject: *Army Technical Proficiency Inspections*, US Army, 1963, <https://usafnukes.com/break-room/records-storage/archive-videos/213-army-technical-proficiency-inspections-1963>

¹⁶⁴ Major General W.A. Enemark, USA, Inspector General, "Realism in TPI's," *The Field Artilleryman*, Instructional Aid 49 (February 1972): 38.

¹⁶⁵ "Senior FA Commanders Conference," *Field Artillery Journal* 45, no. 1 (January-February 1977): 2.

employment. Moreover, any commander contemplating employment had to factor in lengthy approval procedures unlikely to keep pace with circumstances on the ground. U.S. Army forces in Europe thus possessed thousands of nuclear weapons but lacked clear strategy or doctrine for their potential employment, and commanders and troops alike harbored significant doubts about their battlefield utility.

4. Unresolved Doctrine, End of Nuclear Mission (Late 1970s-Early 1990s)

Many critics attribute the Army's doctrinal deficiency to an institutional fixation with weapons systems that spanned decades.

Because Army nuclear doctrine had effectively stalled in the mid-1970s, the final phase of Army nuclear-conventional synchronization – which roughly spans the last two decades of the Cold War – was more focused on weapons systems. The two challenges of the period were how to modernize an aging stockpile of battlefield

nuclear weapons and how to respond to the build-up of Soviet long-range theater nuclear forces (LRTNF). The phase ends with the Army nuclear community seemingly caught off guard by President H.W. Bush's decision to remove unilaterally most U.S. tactical nuclear weapons from Europe in 1991 and dismantle them, thereby ending the Army's nuclear delivery mission.

Following the release of FM 100-5-1, *Conventional-Nuclear Operations* in November 1976, the Army published FM 101-31-1, *Nuclear Weapons Employment Doctrine and Procedures* in March 1977. Carrying forward the policy “to terminate a conflict at the lowest level of hostilities on terms acceptable to the United States and its allies,” FM 101-31-1 was focused on the tangible – procedurally, how to employ nuclear weapons in the event of authorization by the National Command Authority (NCA). It had much less to say on how to transition from strictly conventional to combined conventional-nuclear operations and succeed in nuclear combat. For instance, target categories were offered with little sense of prioritization:

Critical combat units that might be targeted for nuclear strikes include the following:

- (a) Nuclear capable units
- (b) Tank and mechanized units
- (c) Conventional artillery units
- (d) Other units or locations, such as command and control headquarters, nuclear supply points, or bridges.¹⁶⁶

Absent was any wisdom – derived, for example, from war games and field exercises – as to the relative profitability of devoting nuclear weapons to one type of target versus another. Instead, the manual declared that, “There is no simple statement of threat and target defeat criterion that will pertain in all circumstances.”¹⁶⁷ In essence, “constrained use” was a political concept, and an incomplete one at that. It was designed to ensure greater presidential control over nuclear weapons but it did not adequately address the concerns of European allies that early resort to battlefield nuclear use would leave their countries devastated. The concept also failed to explain operationally how the “nuclear pulse” would support NATO’s forward defense. Indeed, concern was expressed that Army commanders might not be permitted to exploit nuclear employment with conventional operations, as it might interfere with negotiations to end the conflict.¹⁶⁸

At this time, Army doctrine was facing a broader identity crisis stemming from the Vietnam debacle and the intensity of the 1973 Arab-Israeli war. Under the moniker of “Active Defense,” the 1976 edition of FM 100-5 essentially advocated a war of attrition in Europe. Not only was such a passive stance unattractive if not demoralizing to Army officers but given the vast size of the Soviet army and the lethality of the modern battlefield it was also likely to fail. Internal dissatisfaction with Active Defense led to a fundamental reorientation of Army doctrine beginning in the late-1970s.

In September 1978, TRADOC’s new commander, General Donn Starry, initiated studies to reorganize Army units to exploit new systems that

¹⁶⁶ FM 101-31-1 (1977), 5.

¹⁶⁷ Ibid.

¹⁶⁸ Rose, *op. cit.*, 181.

were in the pipeline for the 1980s, such as the XM-1 main battle tank and the infantry combat vehicle. The conceptual heart of these “Army ‘86” studies was to defeat Warsaw Pact armies as they planned to fight in echelons. The tactical nuclear aspects of the study were assigned to the Field Artillery School (FAS), as they would bear heavily on field artillery organizations and concepts.¹⁶⁹ Among the problem areas identified were “lack of direction in TRADOC for developing nuclear concepts and doctrine” and “lack of a coherent concept for the employment of tactical nuclear weapons.”¹⁷⁰ In April 1979, TRADOC approved an “Action Plan for Integration of Tactical Nuclear Considerations into TRADOC,” which laid out a three-year corrective program, involving *inter alia*, doctrinal development. FAS Commandant Major General Jack Merritt reported in fall 1979 that:

...we found a systemic problem: the Army lacks a basic concept for operations on an integrated nuclear/nonnuclear battlefield. Such a concept is essential as a basis for developing doctrine, tactics, techniques, and procedures for operating in this type environment. The concept has been developed and published as the U.S. Army concept paper, entitled "Operational Concept for the Tactical Employment of Nuclear Weapons on the Integrated Nuclear/Nonnuclear Battlefield."¹⁷¹

As the operational concept explained:

The Allied divisions in Europe will defend well forward. The Soviet/WP concept is to use surprise, mass, and momentum to

¹⁶⁹ John L. Romjue, *A History of Army 86, Vol I, Division 86: The Development of the Heavy Division, September 1978-October 1979*, U.S. Army Training and Doctrine Command, Historical Office, June 1982, 54

¹⁷⁰ Major General Jack N. Merritt, “On the Move...,” *Field Artillery Journal* 47, no. 5 (September-October 1979): 2.

¹⁷¹ *Ibid.*, 2-3. The concept had been developed by the BDM Corporation. See Preface and Appendix I: “Operational Concept for the Tactical Employment of Nuclear Weapons on the Integrated Nuclear/Nonnuclear Battlefield Summary,” in *Concept for Theater Integrated Nuclear/Nonnuclear Operations*, BDM Corporation, 30 October 1979.

overcome this defense and achieve success. Mass and momentum are achieved through the echelonment of troop formation in offensive operations. Second echelon units are used to intensify efforts on the main axis and exploit success at high rates to a great depth. The continuous commitment of Soviet second echelon units to the battle offers a substantial threat to a successful NATO defense.... Consequently, disruption of the Soviet/WP force generation capability is imperative.

Battlefield interdiction can provide this leverage by attacking the echelon apparatus.... The primary objective for battlefield interdiction is to disrupt the momentum of echeloned forces prior to their commitment to battle. The goal is to preclude an unacceptable presentation of forces in the first echelon battle and to develop the opportunity for initiating offensive action.

The principal elements of the integrated tactical nuclear concept are:

- Interdiction of enemy forces before they join the battle is the preferred role for tactical use of nuclear weapons.
- In the Central Battle, effective counterfire [against Pact nuclear delivery units] will contribute directly to the survivability of the total force. Other Central Battle targets should include C3, air defense, and unengaged maneuver elements.
- Tactical employment of nuclear weapons provides a means for dealing with otherwise unmanageable target presentation rates and can prevent catastrophic failure of conventional forces.
- Tactical employment of nuclear weapons provides an opportunity for initiating offensive operations.
- All planning, coordination, and employment of nuclear weapons must be integrated with nonnuclear force operations both offensive and defensive.
- Integration is achieved through use of means common to both nonnuclear and nuclear operations for intelligence collection and fusion, target acquisition, C3, operations planning, and fire support. Transition between nonnuclear and nuclear operations should be avoided.

- Dual-capable systems are essential for the continuous target planning and attack required for integrated nuclear and nonnuclear operations.¹⁷²

In short, the conventional doctrine community, looking for ways to regain the initiative, and the nuclear doctrine community, seeking to reduce self-inflicted nuclear damage on NATO soil and come to grips with a lengthy nuclear release process, converged on the same deeper regions of the battlefield the so-called “Extended Battlefield. Since this region lay beyond the range of most Army weapons at the time, greater reliance on air support would be needed; at least for some years until longer-range Army weapons (and target acquisition systems) could be fielded. It was this recognition that gave rise to the AirLand Battle concept, which became the core of the completely revised FM 100-5 in August 1982.¹⁷³

In contrast to the 1976 edition, FM 100-5 (1982) incorporated nuclear aspects throughout its many chapters. It also gave more prominence to chemical and electronic warfare, adding greater dimension to the integrated battlefield. The new edition proclaimed:

By extending the battlefield and integrating conventional, nuclear, chemical, and electronic means, forces can exploit enemy vulnerabilities anywhere. The battle extends from the point of close combat to the forces approaching from deep in enemy territory. Fighting this way, the U.S. Army can quickly begin offensive action by air and land forces to conclude the battle on its terms.¹⁷⁴

¹⁷² BDM Corporation, *op. cit.*, 63-64.

¹⁷³ Information in this paragraph is drawn from Lieutenant Colonel Richard Hart Sinnreich, USA, “Strategic Implications of Doctrinal Change: A Case Analysis,” in *Military Strategy in Transition: Defense and Deterrence in the 1980s*, Keith A. Dunn and William O. Staudenmaier, eds. (Boulder, CO: Westview Press, 1984), 45-48.

¹⁷⁴ Department of the Army, Field Manual FM 100-5, *Operations*, August 1982, 1-5. Hereafter FM 100-5 (1982).

The new manual upheld the nuclear package planning construct but related it to the deep battle. More definitive language and a new emphasis on rear area targets were evident:

- ...preferred [nuclear] targets are –
- Enemy nuclear delivery means.
 - Key command and control elements.
 - Support forces in the rear of committed elements.
 - Follow-on or deep-echeloned forces.
 - Reserves.¹⁷⁵

A radical departure from previous Army doctrine, FM 100-5 (1982) drew scrutiny and heavy criticism from European allies. Because nuclear references were woven throughout the document, they feared that the U.S. Army had regressed to seeing nuclear weapons as simply “bigger bullets,” a view that was anathema to NATO. The European allies also rejected the doctrine’s notion of a counter-offensive into enemy territory as unfit for a defensive alliance. Concurrently with the FM 100-5 revision, SACEUR had been developing independently a concept for deep or “Follow-On Forces Attack” (FOFA), motivated by the hope that advanced conventional technologies might substitute for nuclear weapons for some missions and thereby raise the nuclear threshold. While the latter was more to European liking, it was often confused with and overshadowed by the more controversial former. Thus, despite being dual-hatted as Commander in Chief, U.S. European Command and SACEUR, General Bernard Rogers, USA, flatly disavowed for NATO the Army’s AirLand Battle doctrine.¹⁷⁶ In effect, FM 100-5 (1982) remained a service doctrine; it did not spring from any Office of the Secretary of Defense (OSD) initiative or guidance.¹⁷⁷

¹⁷⁵ Ibid., 7-12.

¹⁷⁶ Information in this paragraph is drawn from Sinnreich, *op. cit.*, 50-54. There were U.S. critics, as well. See, for example, Maiorano, *op. cit.*

¹⁷⁷ Maiorano, *op. cit.*, 114.

In January 1986, the Army issued its first update since 1977 of FM 10 - 31-1, *Nuclear Weapons Employment Doctrine and Procedures*. The manual was once again published as a Marine Corps manual but also as an Air Force and Navy manual. In response to criticism that the Army was ignoring the likelihood of initial nuclear use by Soviet forces, FM 101-31-1 opened with a clear statement and concession:

Soviet military doctrine emphasizes rapid advance by combined arms formations, coupled with nuclear and nonnuclear strikes, to destroy the adversary's ability to defend. The Soviets make little distinction between nuclear and nonnuclear operations. They are better equipped, structured, and trained to conduct NBC [nuclear-biological-chemical] warfare than any other armed force.

Soviet military planners recognize how decisive a first or preemptive, nuclear attack will be. They stress the need for such an attack. Their priority targets for nuclear attacks are –

- Nuclear delivery means.
- Command, control, communications facilities.
- Prepared defensive positions.
- Reserves and troop concentrations.
- Logistics facilities, especially nuclear ammunition storage points.¹⁷⁸

While echoing the premise in the 1977 edition that the objective of nuclear weapons employment was to end war on terms acceptable to the United States and its allies, the updated manual had a distinctively aggressive tone, consistent with the new AirLand battle doctrine:

Air-land battles require rapid, decisive offensive action to defeat enemy forces. The authority to employ nuclear weapons increases the flexibility and combat power of commanders. Commanders

¹⁷⁸ Department of the Army, Field Manual FM 100-31-1, *Nuclear Weapons Employment Doctrine and Procedures*, January 1986, 1. Hereafter FM 100-31-1 (1986).

must use maneuver forces to exploit the advantages gained from nuclear weapons. *They should not keep tactical nuclear weapons in reserve to use as a last resort to avoid destruction or defeat.*¹⁷⁹

Gone was the criteria of 1970's manuals that "The situation facing corps at the time nuclear weapons are requested must there be grave."¹⁸⁰

The doctrinal reinvigoration set in motion by AirLand Battle was overshadowed by drastic political change in the late 1980s, however. The fall of the Berlin Wall in 1989 helped signal the collapse of Soviet rule over Eastern Europe and with it, much of the rationale for NATO nuclear planning. In response, President George H.W. Bush quickly put an end to the Army's nuclear modernization program and called for negotiations with Moscow to remove short-range nuclear missiles from Europe (see below). The Army's senior leadership seemed unable to keep up with the pace of this geo-strategic change. In late 1990, Lieutenant General Dennis Reimer, Deputy Chief of Staff for Operations and Plans, was still speaking of the need to maintain Army nuclear readiness in Europe:

The U.S. has announced we're prepared to withdraw all our artillery-fire atomic projectiles, or AFAPs, as long as the Soviets do. So the nature of and the requirements for AFAPs probably will change in Europe.

That doesn't necessarily mean they're going away. We can always reinforce Europe very quickly if we have to, so we don't have to have that capability stationed in Europe.

We're going to have to come to grips with just what the role of the nuclear Army is, and that's under a great deal of discussion right now. The important thing is the nuclear Army played a great part in winning the Cold War. We need that capability because it "buys" a great deal of deterrence.

¹⁷⁹ Ibid., 2-3. Emphasis added.

¹⁸⁰ RB 100-30, Vol I (1976), 112.

So the question becomes, Can we maintain our nuclear readiness in places like Europe? And the answer is, we must maintain that capability, even if it's in a different form than we currently have.¹⁸¹

Within nine months, President Bush would end the Army's nuclear mission, leaving unresolved the doctrinal dilemmas that the service struggled with throughout the Cold War.

In terms of force posture, this last phase of nuclear-conventional synchronization saw the Army further reduce its reliance on nuclear weapons while also modernizing those that remained. As part of this modernization, the Army managed to acquire a system, the Pershing II, capable of strategic strikes against the Soviet Union. There were some counter-currents, as well, such as introducing nuclear-capable delivery systems to new units and the fielding of major combat systems without CBRN defensive capabilities. These inconsistencies reflected the lack of clear doctrine on, and service prioritization of, nuclear-conventional synchronization. The modernization of battlefield nuclear warheads, using lessons learned in the 1950s, proved highly controversial.

Stung by the political repercussions of exercises like 1955's CARTE BLANCHE, which projected millions of soldiers and civilians killed in a theater nuclear exchange, U.S. nuclear scientists were charged with making tactical nuclear weapons more discriminate and effective in stopping Soviet armor.¹⁸² In 1958, Livermore scientist Samuel Cohen invented a concept for increasing the emission of neutrons while reducing the blast effects of a thermonuclear weapon, resulting in an enhanced radiation weapon (ERW) or so-called "neutron bomb." The design was proven in 1963 but production languished with the U.S. shift in emphasis to conventional forces. Nonetheless, the need to replace obsolescent nuclear weapons in Europe prompted the Army to consider its options.

¹⁸¹ "Reshaping the Army: A Versatile, Mobile Force to Project Power Worldwide," Interview of Lieutenant General Dennis J. Reimer, Deputy Chief of Staff for Operations and Plans, by Patricia Slayden Hollis, *Field Artillery* (December 1990): 5.

¹⁸² Brigadier General Edwin F. Black, USA (ret.), and S.T. Cohen, "The Neutron Bomb and the Defense of NATO," *Military Review* 58, no. 5 (May 1978): 56.

The Joint Commission on Atomic Energy rejected development of new warheads based on older fissio concepts, leaving the Army little choice but to pursue the ERW.¹⁸³

Once a *Washington Post* reporter publicized development of the ERW in 1977¹⁸⁴, neither the Army nor the White House was prepared for the public and international relations backlash attendant to a weapon that “kills people but leaves buildings standing.” After straining relations with the NATO allies over whether they would deploy it, President Carter decided not to proceed with production of the ERW in 1978.¹⁸⁵ When President Reagan took office in 1981, Carte’s decision was overturned, and ERWs were produced for the Lance missile and 8-inch artillery shell. To avoid another rift in NATO, however, Reagan decided that the ERWs would be stored in the United States.

Army procurement official could be excused if they felt whiplashed: development of more modern weapons that would have mitigated the collateral damage concerns of the 1950s were authorized by the Ford Administration, initially supported and then opposed by the Carter Administration, and finally produced by the Reagan Administration but withheld from the European theater. The development and testing of doctrine governing the application of ERWs in the face of these disruptions and constraints was all but impossible.¹⁸⁶ Thus, Lance deployed to Europe with a “regular” nuclear warhead, with its higher potential for unwanted collateral damage.

In 1978, Lance also received a non-nuclear warhead. The so-called non-nuclear Lance (NNL) was favored by Congress as a means of forestalling the need to resort to nuclear weapons.¹⁸⁷ It featured a 1,000-pound

¹⁸³ Maiorano, *op. cit.*, 131.

¹⁸⁴ Walter Pincus, “Neutron Killer Warhead Buried in ERDA Budget,” *Washington Post*, June 6, 1977.

¹⁸⁵ Zbigniew Brzezinski, *Power and Principle: Memoirs of the National Security Adviser, 1977-1981* (New York: Farrar, Straus, Giroux, 1983), 301-306.

¹⁸⁶ For an interesting conceptual treatment of ERW, see Lieutenant Geoffrey C. Davis, USA, “Doctrinal Option: The Potential of the Enhanced Radiation Warhead in Europe,” *Field Artillery Journal* 50, no. 4 (July-August, 1982): 48-50.

¹⁸⁷ Harold J. Logan, “House Votes Money for Lance Missiles,” *Washington Post*, June 25, 1977.

warhead carrying 836 bomblets. While true dual capability for the Lance could be seen as a gain for nuclear-conventional synchronization, the Army was less than enthusiastic about NNL. Nearly a decade later, the service still lacked a targeting doctrine for the system. It fell to the FAS and field elements to develop one.¹⁸⁸ The FAS conceded that nuclear fire support remained Lance's primary battlefield mission but posited that in a non-nuclear mode, Lance could be used to target Soviet short-range nuclear missiles, such as the SCUD and SS-21. Since its bomblets were of no use against Soviet armor, however, NNL's contribution to the deep battle concept then in vogue would be to attack softer targets like forward headquarters to deliver "interdiction-like effects."¹⁸⁹

Another Army system impacted by the drive to conventionalize was the Nike-Hercules nuclear-armed SAM. In the mid-1970s, OSD informed Congress that it was considering a conventionally-armed replacement for Nike-Hercules.¹⁹⁰ The SAM remained in service with USAREUR until 1983, when the non-nuclear Patriot took over.

The Army ascribed operational logic to its proliferation of nuclear-capable artillery: posing an insurmountable targeting challenge to the Soviets, whose operational success depended on neutralizing NATO nuclear forces.

For all these efforts to reduce the Army's reliance on nuclear weapons, the service was also widening its ability to use them. In particular, Army leadership praised the introduction of the M198 155-mm howitzer in 1978 as bringing a nuclear weapons delivery capability to light divisions.¹⁹¹ Considering the emphasis that Soviet doctrine put on the destruction of nuclear-capable units, the Army hoped that by proliferating nuclear-capable artillery it would put additional

¹⁸⁸ Captain Jim L. Claunch, "Deep Battle Lance: A Nonnuclear Doctrinal Primer," *Field Artillery* (August 1987): 15-16.

¹⁸⁹ Ibid.

¹⁹⁰ Schlesinger, *op. cit.*, 24.

¹⁹¹ "The Journal Interviews GEN John R. Guthrie," *Field Artillery Journal* 46, no. 4 (July-August 1978): 15. As General Claunch observed, "Now with the M198 going to our light divisions, only the airborne and air assault units will be solely nonnuclear."

burdens on Soviet targeting and ensure an adequate number of surviving artillery tubes for nuclear missions.¹⁹²

The neglect of nuclear hardening had multiple causes and was not unique to the Army.

While the Army remained bullish on nuclear weapons delivery systems, it showed much less enthusiasm for systems designed to protect

against chemical, biological, and radiological (CBR) effects. In particular, the Army was sternly criticized for developing two major combat systems without collective crew protection, the Abrams M-1 tank and the Bradley M-2 infantry combat vehicle. Commenting on these omissions in 1977, a congressional expert on theater nuclear forces opined, “Continued reliance upon fighting vehicles ill-equipped to operate in a CBR environment is nothing short of criminal.”¹⁹³ Perhaps due, in part, to such criticism, NBC collective protection was added in later production runs of both systems. While beyond the scope of this report, it is likely that retrofitting such collective protection was more costly than if it had been part of the original production specifications.¹⁹⁴ That the Army was initially willing to set aside CBR protection underscored that nuclear-conventional synchronization was not a high service priority.

Growing concern about the ability of NATO nuclear-armed aircraft to penetrate Warsaw Pact air defenses and Soviet deployment of new SS-20 IRBMs in the late-1970s stimulated modernization of NATO’s LRTNF.¹⁹⁵

¹⁹² This thinking was reflected in the Secretary of Defense’s annual report: “The 155mm howitzer is NATO’s dominant artillery piece. The large number of these weapons deployed throughout the force structure increases the survivability and flexibility of our short-range nuclear forces.” Caspar W. Weinberger, Secretary of Defense, *Annual Report to Congress*, Fiscal Year 1985, February 1, 1984, 200.

¹⁹³ Jeffrey Record, “Theatre Nuclear Weapons: Begging the Soviet Union to Pre-empt,” *Survival* 19, no. 5 (1977): 210.

¹⁹⁴ As recently noted, “The initial cost to get CBRN survivability requirements into a system is estimated to be 1% of program cost if included early in the acquisition process.... Incorporating CBRN survivability protection requirements into a system after initial fielding can incur significant impacts to the program.” See, Mark Diglio, “CBRN Survivability: Defining a CBRN Mission Critical System,” *Countering WMD Journal* 19 (Summer/Fall, 2019): 59.

¹⁹⁵ Michael Quinlan, *Thinking About Nuclear Weapons* (Oxford, UK: Oxford University Press, 2009), 93.

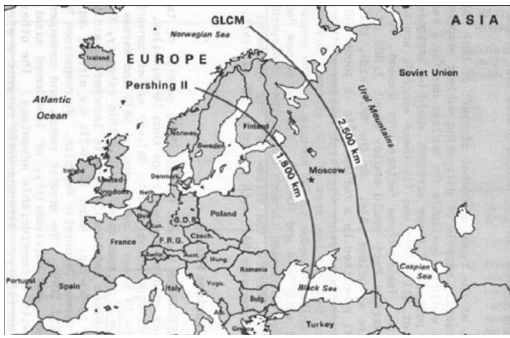


Figure 4: U.S. Army Pershing II and U.S. Air Force GLCM ranges. From NATO and the Warsaw Pact 1984: Force Comparisons, NATO Archives.

Since the late-1960s, the Army had been developing a successor to its Pershing Ia, a missile with much greater accuracy that would allow a smaller nuclear warhead to achieve the same mission while reducing collateral damage. As explained by Brigadier General Lynwood Lennon, Deputy Director for Nuclear and Chemical Matters in the mid-1970s, the Army's main

interest in developing the "Pershing II" was "a desire to do a better, more efficient job of wrecking an enemy airfield without demolishing the town nearby."¹⁹⁶ Mindful of the SS-20's extensive reach, the importance NATO allies attached to an offsetting response, and the greater penetrativity of ballistic missiles over aircraft, DoD approved a range extension that had been under consideration for the Pershing II, from about 640 km to nearly 1,800 km. The three-fold increase meant that from West Germany the Army could now deliver nuclear weapons well into Soviet territory although short of Moscow (see Figure 4). While the Army preferred to downplay this range increase,¹⁹⁷ the Soviets were clearly unnerved by the potential that Pershing II could hit critical targets such as command bunkers in the eastern USSR in as little as six-to-eight minutes.¹⁹⁸

The resolve NATO demonstrated in deploying Pershing II (and the GLCM) despite mass protests and the new military risks it posed helped persuade the Soviet Union to agree to the Intermediate Range Nuclear Forces (INF) Treaty in 1987, which eliminated SS-20s and the Pershing II, as well as other ground-based theater missile systems, by June 1991.

¹⁹⁶ Quoted in Christopher Paine, "Pershing II: The Army's Strategic Weapon," *Bulletin of the Atomic Scientists* (October 1980): 25.

¹⁹⁷ For example, in its special "Salute to Pershing" issue in 1977, *Field Artillery Journal* does not include a single mention of Pershing II's range. See, for example, Major Alan L. Moore, Jr., USA, "Pershing: A Weapon for Long-Range Fire Support," *Field Artillery Journal* 45, no. 3 (May-June 1977): 26-28.

¹⁹⁸ Michael Getler, "Pershing II Missile: Why It Alarms the Soviets," *Washington Post*, March 17, 1982.

As the long-range theater nuclear forces competition was playing out in the mid-1980s, the Army proceeded with the modernization of its eight-inch and 155-mm nuclear artillery shells. The old rounds would be replaced on a less than one-for-one basis, thus enabling NATO to honor its October 1983 decision to unilaterally withdraw 1,400 nuclear warheads from Europe. This was in addition to the 1,000 nuclear weapons NATO decided to scrap unilaterally in order to make the Pershing II and GLCM deployment decision in 1979 more palatable to European publics. While the new 155-mm artillery shells were not ERWs, reportedly they could be converted to such quickly.¹⁹⁹

For all of its unevenness, the Army effort to fashion a workable force posture for conventional-nuclear conflict in Europe came to an abrupt halt with the fall of the Iron Curtain in 1989, as noted earlier. Citing revolutionary changes sweeping the Soviet Bloc, President H.W. Bush announced in May 1990 cancellation of plans to modernize NATO's tactical nuclear weapons. He also called for a NATO summit to agree on objectives for future negotiations between the United States and the USSR on short-range nuclear missile forces in Europe. For the Army, modernization of artillery shells was cancelled, as was development of a follow-on to the Lance missile. In essence, nuclear delivery systems that could only hit targets in countries that were no longer part of the Soviet empire – East Germany, Poland, and Czechoslovakia – were no longer needed or justifiable.²⁰⁰

In September 1991, President Bush went further and announced that all U.S. ground-launched tactical nuclear weapons would be removed from Europe. As publicly detailed by Secretary of Defense Dick Cheney and CJCS General Colin Powell, about 1,000 artillery rounds and 700 Lance warheads would be removed from Europe. They, and another 400 nuclear artillery rounds and Lance warheads stored in the United States, would be

¹⁹⁹ Daniel Charles, "NATO Sets Itself Another Nuclear Snare," op-ed, *Washington Post*, July 1, 1985.

²⁰⁰ Bush's gesture was also intended to help clear the path to German reunification by reassuring Moscow. See "Bush Scraps New NATO A-Arms: Changes in Soviet Block Get Credit," *Los Angeles Times*, May 3, 1990.

destroyed.²⁰¹ Following this Presidential Nuclear Initiative (PNI), NATO's Nuclear Planning Group announced in October 1991 that the Alliance also would be greatly reducing – but not eliminating – U.S. nuclear gravity bombs based in Europe. While USAREUR thus would still have a form of nuclear fire support to draw upon, the Army itself had been ordered out of the nuclear business.

The denuclearization of the Army came about swiftly. General Powell had long favored it and floated with Secretary Cheney the idea of eliminating the Army's nuclear artillery rounds in the spring of 1991.²⁰² Cheney and the four service chiefs were all opposed then, but in the wake of events in Europe and the President's determination, they relented and endorsed the PNI.²⁰³ Abetted by the mandated destruction of the Pershing II under the terms of the INF Treaty, the Army pivoted rapidly, returning its nuclear weapons and handling equipment to the United States, deactivating Lance battalions, and re-deploying some other artillery units to CONUS by the end of 1992.²⁰⁴

On the training front, this final phase of nuclear-conventional synchronization was marked by continuing dissatisfaction over the level of realism in nuclear unit evaluations. In time, the TPI was recast as the Nuclear Surety Inspection (NSI). By the mid-to-late 1970s, the issue of inspection realism drew more commentary. A letter to the editor of *Field Artillery Journal* in April 1977 was blunt:

Some senior commanders erroneously use the NSI evaluation to determine their unit's entire nuclear ability. First of all, the

²⁰¹ Susan J. Koch, "The Presidential Nuclear Initiatives of 1991-1992," *Case Study Series 5*, Center for the Study of Weapons of Mass Destruction, National Defense University, September 2012, 11, 53, n 41.

²⁰² As a former commander of U.S. Army V Corps, Powell became opposed to theater nuclear weapons because of concerns over collateral damage in West Germany, as well as the risk of Soviet nuclear retaliation and further nuclear escalation. See "Nuclear Tipping Point" *Introduction by General Powell*, Nuclear Threat Initiative, January 22, 2010. Available at: https://www.youtube.com/watch?v=ZgjPkDug_rU&t=6s.

²⁰³ Koch, *op. cit.*, 5-7.

²⁰⁴ See, for example, "V Corps Artillery," *Field Artillery* (December 1992): 12.

inspectors only observe two or three days of the unit's nuclear training. Second, the NSI is not conducted in conjunction with a test of the conventional capabilities. Therefore, they do not observe the unit performing all of its missions together. Third, most units conduct their NSI with just one nuclear round (simulated). They have not performed the equally complex problems of storing, securing, and transporting several rounds at the same time. Fourth, the NSI team rarely observes a 24-hour operation. Fifth, many commanders use their surveyors and [Fire Direction Center personnel] for [nuclear weapon] assemblers or security guards. These personnel would not be performing these functions in daily tactical operations. We are kidding ourselves that the NSI is a true test of any unit's nuclear capability.²⁰⁵

The author, a field artillery officer, noted that the FAS was in the process of incorporating all nuclear surety-related tasks into an Army Training and Evaluation Program (ARTEP), the new standard means by which the Army assessed a unit's readiness for operations.

The letter drew a supportive response in the following issue, which also identified specific nuclear readiness deficiencies

For years we field artillerymen have deluded ourselves by not training as we will fight with our nuclear capabilities. We have taken training tests separate from technical proficiency inspections for the sake of getting passing grades. We have to bite the nuclear bullet now and combine nuclear surety inspections (NSI) with ARTEPs, even if it means a few "UNSATs" given until field artillery battalions get the additional personnel (for guard and special weapon assembly), radios, and vehicles needed. Regulations and directives must be streamlined. A field artillery battalion needs to practice moving their conventional basic load and several nuclear rounds (trainers) at once. There will be no "transition" to a nuclear war. Once a unit moves out it has to be ready to fight in a nuclear environment. Tactical nuclear warfare, if

²⁰⁵ Major C. F. O'Donnell, USA FA, "Nuclear Training," *Field Artillery Journal* 45, no. 2 (March-April 1977): 5-6.

approved by National Command Authorities, will be an extension of the conventional war and we must be ready to fight it right the first time²⁰⁶

Responding to the dissatisfaction, the Army Chief of Staff directed in April 1978 that noncustodial, nuclear-capable units would henceforth be certified by the chain of command through evaluation by ARTEP. "The approval of this concept ended a long and tortuous road for the US Army. Field Artillerymen had been aware for many years that the Nuclear Surety Inspection (NSI) was unrealistic. The NSI system drove units and major commands to formulate doctrine that insured satisfactory NSI ratings, rather than to provide good training. It has been said that the NSI produced a soldier trained '...to do well what need not be done at all.'"²⁰⁷

By switching to the ARTEP, Army artillery units more realistically trained for and were evaluated against the demands of combined conventional-nuclear operations.

The switchover to ARTEP was generally welcomed by field artillery units. As the 1st Battalion, 14th FA reported in early 1979:

The nuclear portion of the ARTEP was realistic and tactically oriented. Gone were the spit shined guards and the showcase vehicles. In their place, the soldiers found the realistic pressures of long hours of hard work and constant demands for alertness. The special weapons vehicles were required to be combat ready for an extended period of time while being used for their primary conventional functions. The demands of the battalion's assets were far flung and constant. Transporting the prescribed nuclear load (PNL) in M520 Goers placed great demands on all vehicles and required the highest state of maintenance.²⁰⁸

²⁰⁶ Lieutenant Colonel Gordon A. Longabach, USA FA, "NSI and the ARTEP," *Field Artillery Journal* 45, no. 3 (May-June 1977): 6.

²⁰⁷ Major General Jack N. Merritt, "On The Move...", *Field Artillery Journal* 46, no. 4 (July-August 1978), 2.

²⁰⁸ Lieutenant Colonel Manuel Lopez, USA, FA, "TVI – Great System," *Field Artillery Journal* 47, no. 1 (January-February 1979): 6.

Later that year, another field artillery officer in Europe spoke favorably of the ARTEP and the improvement in training realism:

During the ARTEP the battalion also was evaluated on air resupply, emergency destruction of the PNL, cancelled fire and repackaging, an M424 [nuclear round] high burst, dry nuclear missions, nuclear accident procedures, nuclear custody and accountability, and Seventh Army Nuclear Release Authentication System (NRAS) procedures. No significant problems were identified and conventional operations conducted concurrently did not adversely affect nuclear play. Several nuclear actions were conducted in full mission oriented protection posture.

A key factor insuring success on the ARTEP was careful prior planning. Every participant had been thoroughly briefed on nuclear procedures and techniques. In training, the battalion had tested the worst case, simultaneous nuclear missions during displacements, so the system had already been strenuously exercised. This paid off because the Third Infantry Division Artillery truly put the battalion through its paces. The density and intensity of events forced the 1-76th FA to strain every resource to meet the ARTEP standards.²⁰⁹

The switch to ARTEP did not automatically change mindsets in the field however, and it was necessary to caution commanders not to use ARTEP as a test, the way that NSI was, but rather as a training tool.²¹⁰

Along with the shift to the nuclear ARTEP, TRADOC and the FAS were coming to grips in the late-1970s with educational and training deficiencies identified in the aforementioned Action Plan for Integration of Tactical Nuclear Considerations. Their aim was for all training publications to include the nuclear requirements for integrated battle. Significant schoolhouse changes also were identified

²⁰⁹ Lieutenant Colonel Robert B. Rosenkranz, "The 'Nuclear' ARTEP in USAREUR – An Idea Whose Time Has Come," *Field Artillery Journal* 47, no. 4 (July-August 1979): 18.

²¹⁰ Merritt, *op. cit.* (July-August 1978), 3.

The first phase of the instructional segment of the Action Plan involves technical instruction for which detailed procedures are available. At Fort Sill, this includes restarting instruction such as 8-inch Atomic Assembly Courses and reincorporating Nuclear Target Analysis (Prefi 5) into the core curriculum of the FA advanced course. Additionally, a Custodial Unit Course is being developed to prepare soldiers en route to special weapons custodial detachments. Nuclear command and control instruction is also being developed and will be incorporated into appropriate resident courses. The second phase of the instructional segment is to develop and modify lessons to incorporate tactics and techniques evolving from the basic concepts. This will provide instruction on how to employ tactical nuclear weapons on the integrated battlefield to include such staff responsibilities as developing and modifying basic plans in light of existing situations, requesting and implementing release, and exploiting the effects of nuclear strikes with local offensive action. Soldier skills required in this environment will be integrated into individual training. In an effort to incorporate nontechnical instruction now, the Command and General Staff College is initiating a guest speaker program which should be made available to other TRADOC schools through video tapes of each presentation. This guest speaker program will invite senior personnel to discuss nuclear employment policy, NATO concepts for selective employment, air support of integrated operation, and integration of nuclear planning at division, corps and army group level.²¹¹

Even as the Army was trying to reinvigorate nuclear education in the schoolhouse, the clock was running out on nuclear exercises in Europe. The unravelling of Communism and the prospect of German reunification made simulated nuclear strikes on German soil politically unacceptable to the West German government. In early 1989, West German Chancellor Helmut Kohl called an abrupt end to NATO's WINTEX-CIMEX exercise.²¹² Within days of President Bush's cancellation of tactical nuclear weapons modernization, NATO announced in May 1990 that it was cancelling the WINTEX-CIMEX exercises until more politically relevant

²¹¹ Merritt, *op. cit.* (September-October, 1979), 3.

²¹² Melissa Healy, "NATO Cancels War Games to Shift Scenarios," *Los Angeles Times*, May 20, 1990.

and acceptable scenarios could be devised.²¹³ Within months, the main rationale for a revamped nuclear education and training edifice collapsed, as President Bush ended the Army's nuclear delivery role. Consequently, TRADOC, FAS, and the Army Inspector General turned their attention to closing down nuclear training and personnel reliability programs.²¹⁴

Assessing the Army's Cold War Approach to Nuclear-Conventional Synchronization

Across these four phases spanning the 1940s to the 1990s, what did the Army manage to accomplish in terms of nuclear and conventional synchronization? What gaps remained as the Cold War ended?

Nuclear-Conventional Synchronization Accomplishments

Of the three services, the Army probably went farthest in terms of integrating conventional and nuclear weaponry before the Cold War ended. Initially, this was a matter of bureaucratic survival. Without turning to atomic weapons, the Army likely would have seen continuing budget cutbacks and unit drawdowns to fund the nuclear-driven expansion of the Air Force and Navy. As noted, President Eisenhower saw his former service as little more than a national guard to help restore order in a post-apocalyptic America; that is, until the "Airborne Club" undertook bold experiments to reorganize the Army for the nuclear battlefield. The Pentomic division disrupted traditional Army precepts. It was implemented hastily – many of the key enablers, such as APCs, were not available in sufficient numbers – and yet not fast enough, as the Kennedy Administration immediately abandoned the Pentomic division in favor of greater conventional firepower. There was no comparable conventional-nuclear force structure experiment in the Air Force or Navy during the Cold War.²¹⁵

²¹³ Ibid.

²¹⁴ "V Corps Artillery," *op. cit.*

²¹⁵ Tactical Air Command's Composite Air Strike Force (CASF) of the 1950s did not entail the reorganization of basic Air Force units but merely combined conventional and nuclear-capable units for rapid and temporary overseas deployment. Brigadier General Henry P. Viscellio, USAF, "Composite Air Strike Force," *Air University Quarterly Review* 9, no. 1 (Winter 1956-1957): 27-38. As noted in Chapter Three, the Air Force certainly was the most enthusiastic adopter of nuclear weapons but until the mid-1960s, the service was more interested in supplanting its conventional munitions with nuclear weapons, not synchronizing them.

While the main drive to nuclearize may have been bureaucratic, over time the Army ascribed operational logic to its proliferation of nuclear-capable artillery. As observed by the Army's artillery community in 1961, "... since cannon are present in large numbers, a nuclear delivery means is almost always immediately available. It is therefore highly unlikely that the enemy will ever be able to eliminate our nuclear capability."²¹⁶ This survivability through redundancy posed a major challenge to Warsaw Pact planning. As Soviet Colonel-General N.A. Lomov conceded at the time:

For achieving the operation-level goal, it is now important to defeat not only the land and aviation enemy groupings in the theater of military operations, but above all its nuclear groupings, as without their decisive destruction, one can sparsely count on the successful carrying out of the missions in the operation.²¹⁷

Thus, in the eyes of the Army, "The Soviets admit that, for their offensive to succeed, all or most of the NATO nuclear delivery systems must be destroyed. Considering the number of systems and the number of warheads, this is a tall order demanding intelligence of exceptional scope and accuracy."²¹⁸ This view was embraced by DoD, which assured Congress in the mid-1970s that theater nuclear forces, "introduce major uncertainties into WP planning, complicate the tactical problems of the WP, and increase the risks in any WP attack on NATO."²¹⁹

Army efforts to integrate nuclear weaponry into force structure and doctrine benefitted greatly from the support of senior leaders in USAREUR and Seventh Army, commands which functioned as a vast training ground in which to test and refine concepts. Particularly in the late-1950s, USAREUR took a very pro-active approach to nuclear-conventional synchronization:

²¹⁶ Colonel Jack F. Diggs, "The Future of Cannon," *Artillery Trends*, U.S. Army Artillery and Missile School, November 1961, 17.

²¹⁷ Quoted in Captain Scott R. McMichael, "The Soviet Theater Nuclear Offensive and the European Battlefield," *Field Artillery Journal* 47, no. 5 (September-October 1979): 26.

²¹⁸ *Ibid.*, 27.

²¹⁹ Schlesinger, *op. cit.*, 16.

Department of the Army guidance for the fiscal year 1957 training program in Europe was to base all training exercises on situations where both U.S. and aggressor forces had tactical atomic weapons.... The U.S. Army, Europe, had already anticipated the shift in doctrine and had included the employment of simulated atomic weapons and guided missiles in all of its major field exercises and maneuvers. Among other responsibilities, units had to be able to operate and protect themselves in a contaminated environment, exploit the opportunities provided by friendly atomic strikes, and conduct operations in widely dispersed formations in anticipation of enemy fire. Soldiers also learned how to decontaminate themselves and their equipment once they had cleared a contaminated area.

Because knowledge of the tactical use, effects, and exploitation of atomic weapons was so important, particularly at lower echelons, the USAREUR assistant chief of staff for operations formed an ad hoc committee to study atomic training requirements and to make recommendations. The committee screened training tests and lesson plans from stateside service schools for materials it could use to improve USAREUR atomic training. It published a special circular on atomic warfare training that prescribed the standards of proficiency each individual was to have at his level of responsibility. It also produced a memorandum that specifically identified the responsibilities of each staff section if atomic warfare occurred. Throughout 1956, USAREUR and the Seventh Army hosted conferences highlighting the command's atomic-capable weapons systems and providing attendees with opportunities to exchange ideas on the best ways to employ them.

The Seventh Army also produced training literature outlining how it planned to fight an atomic war. In *Tactical Guidance for Atomic Warfare*, published in April 1956, leaders identified the requirements for dispersion and all-round security in an atomic environment. The document prescribed a mobile defense with battalions dispersed along dominant terrain, but prepared to concentrate rapidly to counterattack the enemy. Above all, defensive positions were to be supported with integrated conventional and atomic fire support. Commanders would

coordinate counterattacks with atomic strikes aimed to break up enemy concentrations.²²⁰

In short, the seriousness with which USAREUR and Seventh Army took their responsibilities was a major accomplishment for the Army's early efforts to integrate nuclear and conventional weaponry, doctrine, and training. In many respects, these field commands seem to have outpaced the stateside Army.

The Army's determined pursuit of long-range missiles despite staunch opposition from the Air Force and DoD also contributed to nuclear-conventional synchronization in the long run. In particular, the fielding of the Pershing Ia missile in the 1960s freed some tactical aircraft from nuclear QRA, enabling them to be re-assigned to conventional missions. This is a rare and under-appreciated case of inter-service conventional-nuclear balancing.²²¹

Lastly, while it was decades in the making, the Army's reform of nuclear unit inspections ultimately was a success for nuclear-conventional synchronization. Although they were rigorous, the Army's nuclear TPIs were set-piece, with no sense of realism and appreciation for the conventional warfare demands that artillery crews would face in addition to their nuclear responsibilities. By switching to the ARTEP in the late-1970s, Army artillery units more realistically trained for and were evaluated against the demands of combined conventional-nuclear operations.

Remaining Gaps in Nuclear-Conventional Synchronization

For all its accomplishments in nuclear-conventional synchronization, the Army suffered several major gaps, most of which persisted throughout the Cold War. These gaps principally involved doctrine but extended to organization, training, materiel, and other areas. That the gaps endured suggests deep institutional skepticism that the President would ever authorize the use of tactical nuclear weapons – or that approval would come fast enough to matter – and a reluctance by Army leadership to

²²⁰ Carter, *op. cit.*, 264-266.

²²¹ The assignment of U.S. Navy Polaris SLBMs to NATO in the 1960s likewise may have contributed to the reallocation of USAF aircraft to conventional missions, but the phenomena is under-studied.

devote its top intellectual talent to narrowing, much less resolving, the nuclear battlefield conundrum.

The sheer volume of critiques levelled by Army insiders and external observers alike underscores that the Army never really came up with a workable doctrine for operations on a nuclear battlefield. The Army's early thinking about nuclear doctrine bore an unnerving resemblance to the failed doctrine of Britain and France in World War I, namely, the faith in fire – in this case nuclear – to blast a hole through the enemy's ranks that would allow friendly forces to roll unimpeded into vital rear areas. As Lieutenant Colonel A.J. Bacevich, USA, observed:

Army leaders in the 1950s did not acknowledge any similarities between their thinking and discredited offensive doctrines of World War I. They believed that nuclear weapons made all the difference. A few well-placed tactical warheads would accomplish what millions of shells fired over periods of days or weeks had failed to do in World War I. Armed with this faith in nuclear firepower, the Army believed the only question to be the technical one of learning how to pass exploitation forces through an area scorched by nuclear fires

By the middle of 1955 the Army tried to demonstrate that it had answered even that question during a series of nuclear tests designed to illustrate its new tactics. The most important was a well publicized operation called Desert Rock VI conducted at Yucca Flat, Nevada, and involving a composite armored force, Task Force Razor, positioned 3,000 meters (about two miles) from a 30-kiloton (30,000 tons of TNT) atomic device. When the device was detonated a choking dust and terrifying flash of light instantly filled the vehicles nearest to ground zero. But neither vehicles nor crews appeared to suffer any adverse effects. Within a half-minute Task Force Razor had opened fire with its tank cannon and machine guns. Within three minutes communication had been established. And eight minutes after the blast, Task Force Razor was advancing toward its objective, skirting within 900 meters of ground zero, even as a mushroom cloud billowed 40,000 feet above the desert floor.²²²

²²² Bacevich, *op. cit.*, 108-114.

The Army's own evaluation could not overlook the artificial staging measures taken, however, and declared the exercise "devoid of tactical authenticity."²²³

This lack of realism extended to Europe, where the Army seemed incapable of devising nuclear employment plans that did not leave West Germany a radioactive wasteland:

In the early 1960s, at a meeting of NATO military commanders, a summary was presented of the results of a number of wargames that had included nuclear weapons. In the view of one of the presenters, "the numbers of nuclear weapons that would be fire in a battle on, say, a corps front would cause so much physical damage (regardless of the numbers of actual military casualties) as to render the idea of mobile or any other form of warfare meaningless. The damage in the battlefield area would be as great as would occur in an exchange of strategic nuclear weapons." Furthermore, the "picture that emerged...was fairly consistent. In a nuclear battle on NATO territory, between 200 and 250 nuclear "strikes" of average yield 20 kt would be exploded in the space of a few days in an area no more than 50 by 30 miles.... The effect would have been indescribable, and meaningless from the point of view of any continuing battle between opposing armies." Rather than allowing sweeping battles of maneuver, therefore, nuclear weapons were bringing untold destruction and "gridlock" to the battlefield²²⁴

West Germany reached a more dire conclusion:

The German Max Planck Institute conducted a large-scale survey in 1971 that looked at the effects a nuclear war would have on Germany.... The study group determined that if only 10 percent of NATO's battlefield nuclear weapons were employed only in the

²²³ Ibid., 112.

²²⁴ Major Michael W. Cannon, USA, "Battlefield Nuclear Weapons and Tactical Gridlock in Europe," School of Advanced Military Studies, U.S. Army Command and General Staff College, November 17, 1988, 3.

area of operations (with densely populated areas being spared) heavy damage would result. Over 10 million people could be expected to die and a radioactive belt would be established along Germany's eastern boundary that would measure 1,000 rads.... When [Soviet weapons] were used on an equal scale, the study group concluded that the “political annihilation” of the Federal Republic of Germany would result.²²⁵

These findings are applicable whether one speaks of the 1950's era of “unconstrained” nuclear use or the subsequent era of “selective” nuclear use. As noted, in the late-1970s, a typical U.S. Army corps package consisted of between 100 and 200 tactical nuclear weapons with a total yield of some 300 kt, and there were two corps (V and VII) deployed in West Germany (see Figure 5).²²⁶

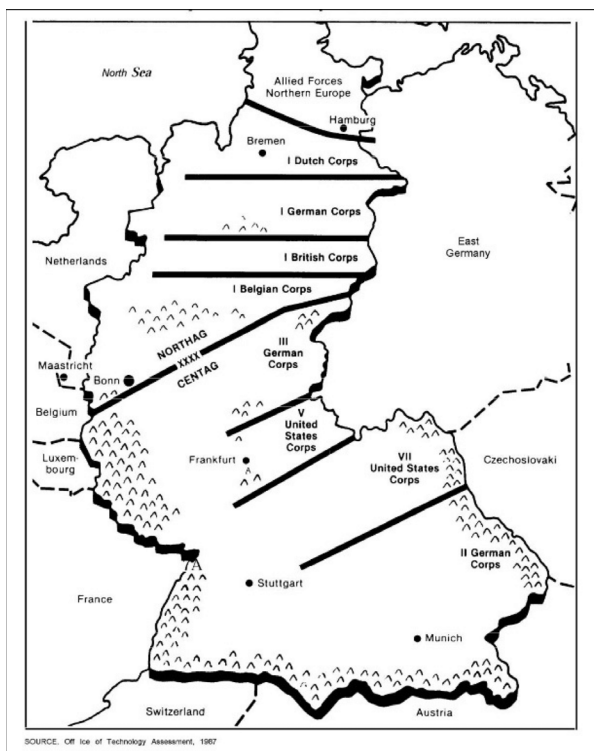


Figure 5: U.S. Army Corps deployment in West Germany, 1987.

If Army doctrine for conventional-nuclear battle lacked realism, it also lacked a credible approach to escalation management. This is because early in the Cold War, Army leaders were critical of the Air Force's doctrine of massive retaliation, which was propelling the growth of SAC at the Army's expense. This stance contained a logic trap, however:

²²⁵ Ibid., 6-7.

²²⁶ RB 100-30, Vol I (1976), 36-39.

To maintain the distinction between the utility of tactical nuclear weapons and the futility of strategic weapons, the Army argued against the likelihood of escalation. The use of smaller tactical weapons would not inevitably lead to the employment of larger ones, as the Service saw it. But such reasoning owed more to faith than to logic.²²⁷

The balance of scholarly writing during the Cold War, and certainly the policy of the Kennedy Administration, reflected deep worries about nuclear escalation that the Army was unable to assuage. Even its own field manuals acknowledged the risk but offered precious little guidance to field commanders. As FM 100-5 (1976) noted, “Retaliatory [nuclear] attacks by the enemy are also of primary concern. The danger of such attacks can be reduced by a proper disposition of forces and a strong counterretaliatory capability.”²²⁸ Left unsaid was the nature of that counterretaliatory capability, how it was to be employed, and what might follow.

Even the Army’s major concept for selective nuclear use, the “nuclear package,” was at odds with the notion of escalation control. In 1990, a contracted study by the Defense Nuclear Agency concluded, “that the yields and quantities [of nuclear weapons] contemplated for selective employment cast doubt on their being recognizable as deliberately constrained selective use and that the doctrinal voids with respect to the ensuing combat cast doubt on their military decisiveness.”²²⁹ In short, the employment of 100 to 200 tactical nuclear weapons by a U.S. corps in a 45- to 90-minute pulse would hardly look selective to the Soviets, particularly as it was unfolding. While the Army’s 1973 tactical nuclear weapons employment policy did consider escalation potential, it put little stock in nuclear employment beneath the pulse level. Yet, arguably, that is where escalation risks would have been more manageable.²³⁰

²²⁷ Bacevich, *op. cit.*, 168-169, n. 3.

²²⁸ FM 100-5 (1976), 10-6.

²²⁹ Richard I. Wiles, Reed E. Davis, Jr., Herbert T. Casey, and William R. Kraft, Jr., *A Net Assessment of Tactical Nuclear Doctrine for the Integrated Battlefield*, ORI, Inc., September 1, 1980, 119. Emphasis in the original. The study benefitted from comments received from CGSC, USAREUR, V and VII U.S. Corps, and others.

²³⁰ The Soviet General Staff was apparently willing to entertain in exercises the use by NATO of less than a dozen nuclear weapons without feeling obliged to retaliate in kind, albeit with certain provisos. See Chapter Four, 266-267.

Beyond identifying doctrinal deficiencies, it is important to understand why they occurred and could not be surmounted. Much had to do with institutional mindsets and bureaucratic politics. The principal mindset that took hold with the advent of the Kennedy Administration was that the President would never give the Army the green light to use its nuclear weapons.²³¹ This was a radical about-face from the Eisenhower Administration, which declared that nuclear weapons would be as available for use in war as any other weapon. The Army thus had little incentive to invest energy in a doctrine governing weapons it could not reliably access, particularly when new challenges were fast upon it, such as the conflict in Vietnam. Neglect of nuclear doctrine entailed a certain risk, however, as Army leaders could not have known in advance how the Cold War would end. In essence, the Army's leadership had come to see tactical nuclear weapons as deterrents, not as a warfighting capability. This left field commanders empty-handed in terms of doctrine if it ever became necessary to fight under the threat of nuclear attack.²³²

Another reason that Army doctrine did not measure up to the challenge of the nuclear battlefield is failure to invest the necessary intellectual capital. The complexities of integrated conventional-nuclear operations demand the most rigorous thinkers, yet distinguished Army officers contend that "too much of the talent of our best minds [went] to inter-Service debate and to the battle of the budget."²³³ This problem is not unique to the Army, as budget share is the lifeblood of the services and each puts its best talents toward it.

It should be acknowledged that, at times, TRADOC leadership impeded development of Army doctrine for the nuclear battlefield. As noted earlier, TRADOC Commander General William DePuy personally rejected the notion of fighting a tactical nuclear battle. He was more interested in cultivating ties with the West German Army, which also opposed battlefield nuclear use for obvious reasons. The result was that FM 100-5 (1976) was virtually stripped of nuclear content, which appeased the

²³¹ Rose, *op. cit.*, 213.

²³² Ibid., 214-216. See also, Major William D. Brown, USA, "Whatever Happened to...Tactical Nuclear Warfare?" *Military Review* 60, no. 1 (January 1980): 52.

²³³ Bacevich, *op. cit.*, 151.

Bundeswehr but set back Army efforts to develop a workable doctrine for conventional-nuclear operations.

Many critics attribute the doctrinal deficiency to an institutional fixation with weapons systems that spanned decades. Recalling the 1950s, Lieutenant General Arthur Collins, Jr. asserted that “the Army hadn't thought through the use of nuclear weapons; there was a tremendous emphasis just to get some nuclear capability, without regard to how it might be used...the Army never related the weapon to the battlefield and how you were going to fight under the conditions that a nuclear war would create in a forward area.”²³⁴ Three decades later, a junior Army officer observed

...it appears that the Army is allowing technology to dictate its doctrine. In the development of a war fighting doctrine, one would expect that an evaluation of the perceived threats would be made first then a doctrine would be proposed to counter those threats. Weapons that have possible use in accomplishing the various missions would then be tested, troops would be trained in their use, and the overall effectiveness of the proposed nuclear-conventional mix would be evaluated. Thus, doctrinal developments, such as the tactical nuclear package, appear to be stopgap measures designed to use nuclear technology without a thorough evaluation of the consequences and overall impact of nuclear warfare on the battlefield²³⁵

While not solely the Army's responsibility, joint doctrine for conventional-nuclear operations also was largely non-existent for the duration of the Cold War. Particularly during the 1950s, the Army and Air Force simply could not agree on the command and control of theater nuclear air strikes or even the targets that would be struck. This inter-service rivalry only encouraged the Army to acquire nuclear-capable artillery and missiles. Calls for joint doctrine to, “define the roles of TACAIR in support of operations on the integrated battlefield” were still being made in the early

²³⁴ Ibid., 133.

²³⁵ Captain Joseph R. Cerami, USA, “Defensive Use of Tactical Nuclear Weapons,” *Field Artillery Journal* 50, no. 4 (July-August 1982): 47.

1980s.²³⁶ AirLand Battle doctrine started to rectify but did not resolve Army-Air Force tensions over theater nuclear operations before the Cold War ended.

Beyond doctrine, the complexity of the subject matter, methods of instruction, and the limitations of the tools available posed significant barriers to raising nuclear awareness across the Army. Because nuclear weapons propagated various effects, to include blast, thermal radiation, and nuclear radiation, planning for their use was a challenging, multi-variant problem, particularly with the limited automated data processing capability at the Army's disposal for most of the Cold War. Regardless, the Army seems not to have been able to distill this complexity into simplified tools that could be readily employed by most soldiers.²³⁷ Rather, nuclear employment had become a highly specialized subject area that was to be avoided. As a junior field artillery officer explained in the mid-1970

Graduates of nuclear weapons employment classes often retain a distasteful memory of classified tomes, myopia-inducing nomograms, and an arcane process bearing little apparent relationship to conventional operations. Their lingering impression is a mixture of awe and disdain, resulting in a desire to ignore the whole topic of nuclear weapons employment. This reluctant attitude is a barrier to developing a workable process for effective nuclear battlefield support.²³⁸

This field perspective suggests that the Army's approach to nuclear education helped to silo nuclear planning rather than promote its synchronization with conventional operations. Along these lines, the notion contained in Army doctrine publications in the mid-1970s that nuclear operations were a problem for brigade-level command and higher likely reinforced the nuclear allergy of the service's rank and file

²³⁶ ORI, *op. cit.*, 152.

²³⁷ For instance, Army manuals did not tabulate or predict combined nuclear weapons effects. Apparently, the choice was to plan against a single effect (e.g., blast damage), which might needlessly inflate the numbers of weapons required while potentially exacerbating collateral damage and other undesirable effects, or try under the pressure of battle to calculate manually the sufficiency of aggregated nuclear effects. A commander does not seem well served by either approach. See FM 101-31-1 (1977), 7.

²³⁸ Ossorio, *op. cit.*, 8.

In terms of tools and processes, nuclear fire planning deficiencies never appeared to be satisfactorily resolved before the end of the Cold War. Much of the problem stemmed from the concept of the “nuclear package,” which placed tremendous burdens of prediction, detection, and adaptation upon corps commanders, battlefield reconnaissance capabilities, and nuclear-qualified target analysts – which would all be operating under the stress of high-intensity conventional combat. As one Army fire support planner observed in the late-1970s:

If released to the corps commander, the package will be refined to meet the actual tactical situation. Weapons will be shifted from one division sub-package to another, timing will be adjusted, conventional fire will be planned to supplement the package, and the aimpoints will be refined. As enemy targets are located, they will be scheduled according to the commander's priorities, and this process will continue until the start of the pulse.... The difficulty of rapidly updating this information, during high intensity combat, borders on the impossible.

In essence:

Most of the [nuclear] package will be fired at targets predicted in peacetime, partially refined before release, but never really confirmed

...Effective nuclear fire planning [thus] requires looking into a chaotic future and determining the best way to manage catastrophe. The natural aversion to this kind of thinking is reflected in the air of unreality and magical allusions which creep into the target analyst's jargon. “Growing mushrooms” emerges as a safely abstract euphemism for mass killing.²³⁹

²³⁹ Ibid., 9-13. Emphasis in the original.

*Recommended Read:
BDM's Concept for Theater
Integrated Nuclear/Nonnuclear
Operations, 30 October 1979.*

After General DePuy left TRADOC and retired in 1977, the Army essentially outsourced to the firm BDM development of its concept for integrated nuclear and non-nuclear operations. In

its concept, BDM was attuned to the shortcomings in the targeting realm, noting that "...[automated] data processing of theater-wide [nuclear] targets will be necessary...manual processing will not meet the anticipated need."²⁴⁰ There is little to suggest that the Army made sufficient progress in the automation and rectification of battlefield nuclear targeting before the Cold War ended.

In terms of organization, the Pentomic division was a bold experiment but one that inflicted much disarray on the service. As an official U.S. Army history recounts, Pentomic deficiencies put field commanders at risk of mission failure:

The concept continued to unravel as observers identified new shortcomings with each successive training exercise. Under the pentomic organization, infantry divisions retained only enough armored personnel carriers to move one reinforced battle group at a time. For an organization whose very existence depended on mobility, this was an extraordinary deficiency.

The USAREUR commander, General Hodes, summarized his concerns in a message he sent to the Army chief of staff, General Taylor, in September 1958. In what he labeled as a realistic appraisal of the combat readiness of his command, Hodes informed Taylor that USAREUR had "reached a point of calculated risk" beyond which he could not recommend proceeding without a complete re-evaluation of the mission and purpose of the command.

²⁴⁰ BDM Corporation, *op. cit.*, 36.

...Complicating the problems caused by force reductions, the general concluded, numerous technical problems plagued some of the new weapons and equipment that were supposed to offset the shortages. The Corporal and Redstone missiles were too immobile and took too long to put into action, the Honest John was not sufficiently accurate, and communications and electronic equipment lacked both range and reliability. Although Hodes promised to use his resources to the best of his ability, he warned that the accomplishment of his wartime mission was no longer a “foregone conclusion.”²⁴¹

General Paul Freeman, who assumed command of USAREUR in May 1962, “expressed the relief of many when he told an interviewer that the only thing he could say about the pentomic division was ‘Thank God we never had to go to war with it.’”²⁴²

The Army lurched from the Pentomic to the ROAD division, which increased conventional staying power but left in abeyance the question of how to organize for *integrated* conventional-nuclear operations. By setting aside the finding of the Oregon Trail study in the mid-1960s, the Army simply stopped trying to adapt force structure to the nuclear battlefield

Regardless of how the Army organized its forces, the service struggled with “hardening” them against the effects of nuclear weapons.²⁴³ As one officer pointed out, for nearly three decades, the Army devoted little analytical attention to the problem: “...how survivable are our forces to nuclear combat? Prior to 1974, virtually no analyses had been attempted in this area.”²⁴⁴ It was not until 1974 that the Army began working with the Defense Nuclear Agency “to determine the degradation of combat effectiveness as a function of the nuclear weapons effects on personnel

²⁴¹ Carter, *op. cit.*, 312-313.

²⁴² Ibid., 443.

²⁴³ “Simply stated, a piece of equipment is ‘hard’ when it can function during and after exposure to defined limits of any or all of the four primary effects of a nuclear weapon: blast, heat, radiation, and electromagnetic pulse (EMP).” Lieutenant Colonel Jerry M. Sollinger, USA, “Improving US Theater Nuclear Doctrine: A Critical Analysis,” *National Security Affairs Monogram Series* 83-3, 1983, National Defense University, 23.

²⁴⁴ Brown, *op. cit.*, 51.

and equipment.”²⁴⁵ A decade later, an Army officer bemoaned the lack of nuclear-hardened gear in the Army: “Its absence lays our forces open to a crushing blow by our adversary and tempts him to use nuclear weapons.”²⁴⁶ The opportunity to snarl our command and control with a relatively small number of nuclear strikes might prove an irresistible temptation. Also, a lack of hardened equipment limits our own use of nuclear weapons.” The neglect of nuclear hardening had multiple causes and was not unique to the Army. The hardening process itself was complex and esoteric, even for the experts of a given system. Mirroring the broader nuclear aversion in the Army, nuclear hardening became a sub-specialty that drew little service member interest.²⁴⁷ The hardening process was a further complication to the acquisition process, one that added cost. While the Army put in place nuclear survivability requirements for many new developmental items, those requirements were often modified or waived during the procurement process. The Army itself acknowledged that such unwarranted exemptions had become a major problem by the early 1980s.²⁴⁸ In essence, the service preferred to spend its money on non-nuclear combat.

For all these reasons, Secretary of Defense Schlesinger observed in 1975, “[Soviet] force posture, equipment, doctrine, and training indicate more emphasis than NATO on combined conventional-nuclear operations; with conventional forces being better prepared than NATO forces to operate in a nuclear and chemical warfare environment.”²⁴⁹ A decade later even the Army had to concede that the Soviets were, “better equipped, structured, and trained to conduct NBC warfare than any other armed force.”²⁵⁰

²⁴⁵ Ibid.

²⁴⁶ Sollinger, *op. cit.*, 23.

²⁴⁷ Ibid., 25-26.

²⁴⁸ Ibid., 26.

²⁴⁹ Schlesinger, *op. cit.*, 14.

²⁵⁰ FM 100-31-1 (1986), 1.

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CHAPTER TWO: The U.S. Navy's Approach to the Synchronization of Nuclear and Conventional Weapons During the Cold War

During the Cold War, what did the synchronization of nuclear and conventional weapons mean for the U.S. Navy in terms of motivation, organization, doctrine, force posture, training, and organization? The answers vary over time. Four phases of nuclear-conventional synchronization, with some degree of overlap, can be identified

1. Scientific investigation and engineering (mid 1940s-early 1950s)
2. Nuclear normalization (1950s-early 1960s)
3. Nuclear ambivalence (mid 1960s-1970s)
4. Strategic renaissance (late 1970s-early 1990s)

Across these phases, what did the Navy manage to accomplish in terms of nuclear and conventional synchronization? What gaps remained as the Cold War ended?

1. Scientific Investigation and Engineering (Mid 1940s-Early 1950s)

In the late-1930s, the Navy was alert to the rapid advances in atomic energy, as it was to other fields of science, and what those advances might mean for the service.¹ With the mobilization of World War II, Navy personnel also played a key role in the Manhattan Project, solving the myriad engineering challenges to weaponize fissile explosive devices and deliver them to a target. Following Hiroshima and Nagasaki, the Navy was keen to demonstrate that atomic weaponry had not made conventional naval forces obsolete but that the two would exist side by side.

In September 1945, Chief of Naval Operations (CNO) Ernest King set up the Special Weapons Division (OP-06), under Vice Admiral W.H.P.

¹ While the U.S. Army dominated the wartime effort to build and deliver the first atomic bombs, it was not the military's first investigation of atomic energy. That distinction belongs to the Navy, which initiated its atomic study, albeit of propulsion and not weapons, in March 1939, seven months before the Army set out on the path to the Manhattan Project. Samuel J. Cox, "The U.S. Navy's Role in the Development and Employment of the Atomic Bomb, 1939-45," U.S. Navy, Naval History and Heritage Command, August 2020.

Blandy, assisted by Commodore W.S. Parsons who was heavily involved in the Manhattan Project. The main function of the new office was to organize and implement Operation CROSSROADS, a test to determine if warships could withstand atomic explosions. CROSSROADS was spurred, in part, by congressional and Army Air Force critics who asserted that atomic weapons made surface fleet outmoded. The Navy was determined to prove otherwise and quickly won Joint Chiefs of Staff and White House backing for a demonstration using actual atomic bombs. By July 1946, a target fleet of U.S. war-surplus and captured naval vessels was moored at the Bikini Atoll in the Pacific. The first 23-kiloton bomb, test shot ABLE, was dropped from an Army Air Force B-29 on July 1st and exploded at a height of roughly 500 feet over some 90 vessels (see Figure 6). Even though the bomb missed the designated aim point by up to 2,000 feet, the results were stark:

The Able burst sank five vessels.... Other vessels were severely damaged, the most dramatic damage occurring to the light carrier *Independence* and the submarine *Skate*, both of which were for all intents and purposes wrecked. Six [more] ships were immobilized, and 23 small fires were started on various other ships...the battleships *Arkansas* and *Nagato* [were] badly burnt and battered.²

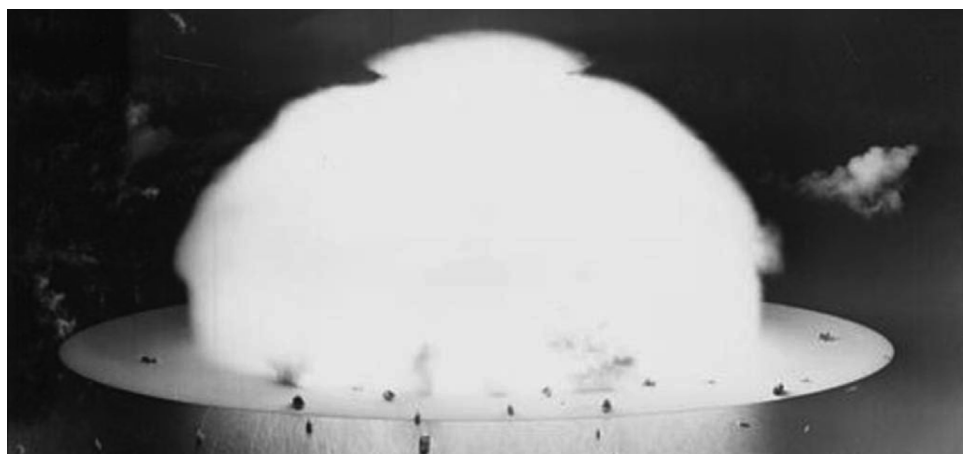


Figure 6: Nuclear blast spreads over target ships during Operation CROSSROADS, 1946. Photo credit: U.S. Library of Congress.

² James P. Delgado, Daniel J. Lenihan, and Larry E. Murphy, *The Archeology of the Atomic Bomb: A Submerged Cultural Resources Assessment of the Sunken Fleet of Operation Crossroads at Bikini and Kwajalein Atoll Lagoons*, U.S. National Park Service, 1991, 24.

Because the ABLE shot was airburst, radiation dissipated quickly and crews were able to re-set the target flee for the second test shot on July 25th, BAKER – another 23 kt-bomb but one submerged at a depth of 90 feet to test the vessels' hull strength. The BAKER detonation displaced two million tons of water that fell back into the lagoon, sinking another nine vessels. Numerous other ships were severely damaged and then scuttled. Radioactive contamination from the water cloud was extensive and prevented the reboarding of the remaining target ships for days and even then, only for brief periods. Subsequent efforts to decontaminate the ships proved futile and most had to be sunk in the ocean depths. The third and final planned test, a deeper underwater detonation, was cancelled by President Truman.³ The Navy initially shrouded the radioactive contamination issue in secrecy. It took until September 1946 for Blandy to publicly acknowledge “only 9 of 92 ships escaped at Bikini,” with the rest “either sunk, damaged or contaminated by radioactivity.”⁴

Study of the radioactive “ghost ships” of CROSSROADS led to some changes in U.S. naval design. Ship surfaces were rounded and wash-down systems were installed to better rinse vessels subjected to fallout.⁵ On one level, “The results demonstrated, at least to the Navy, that a surface task force could survive an atomic attack if minor modifications in fleet routine were instituted – in particular, a more widely dispersed steaming formation and washdown techniques for radiological defense.”⁶ On another level, however:

The primary naval modification after Crossroads were measures to take the [atomic] bomb to sea as a weapon.... In an atmosphere

³ The deep underwater test was conducted as Operation WIGWAM in May 1955. A few hundred miles off the coast of San Diego, a 30 kt nuclear bomb was tested at a depth of 2,000 feet against scale models of submarines. The test demonstrated that a submarine could be destroyed up to a mile away from such an explosion. *OPERATION WIGWAM: Scientific Director's Summary Report*, October 10, 1958. Report Prepared for the Defense Nuclear Agency, 1 February 1980. See also, *United States Nuclear Tests: July 1945 Through September 1992*, U.S. Department of Energy, September 2015, 6.

⁴ Ibid., 27-32.

⁵ Ibid., 31.

⁶ David Alan Rosenberg, “American Postwar Air Doctrine and Organization: The Navy Experience,” in *Air Power and Warfare*, Colonel Alfred F. Hurley, USAF, and Major Robert C. Ehrhart, USAF, eds. (Washington, DC: Office of Air Force History, 1979), 249.

of no adequate defense against nuclear deployment, the Navy, like the rest of the military, embraced nuclear deterrence through the adoption of and subsequent escalation of use of nuclear weapons at sea as a defense.⁷

Indeed, OP-06 was already leaning in that direction; once the planning for CROSSROADS was nearly complete, OP-06 turned its attention to the question of how the Navy could employ atomic weapons.⁸

The Navy succeeded in gaining access to atomic weapons by 1950 but this was a bureaucratic accomplishment, not one of strategy.

As the CROSSROADS tests portended, atomic weapons quickly became the focal point of inter-service rivalry, with the newly independent Air Force dominating budgets, missions, and strategy with

its emphasis on strategic nuclear bombing of Soviet cities and industrial concentrations to deter war. To counter this, the Navy re-conceptualized the aircraft carrier in the late-1940s as a mobile, survivable platform from which to launch nuclear strikes against Soviet land targets. Immediately following CROSSROADS, the Navy formally requested and received permission from President Truman to begin modifying aircraft and carriers for handling atomic weapons.⁹ In only two years, the Navy moved from establishment of its first atomic-capable composite aircraft squadro¹⁰ to the launch of an aircraft carrying an atomic bomb (minus its fissile material) from the deck of an aircraft carrier, in April 1950.¹¹

⁷ Delgado, et al., *op. cit.*, 31.

⁸ Rosenberg, *op. cit.*, 249.

⁹ Jeffrey G. Barlow, "The Navy and the Bomb: Naval Aviation's Influence on Strategic Thinking, 1945-1950," Colloquium on Contemporary History, U.S. Navy, Naval History and Heritage Command, June 1989. See also, Rosenberg, *op. cit.*, 249.

¹⁰ VC-5, under the command of then-Captain and future Vice Admiral John Hayward, a naval aviator who had helped develop the non-nuclear components of the Fat Man atomic bomb. Barlow, *op. cit.*

¹¹ Norman Polmar, *Aircraft Carriers: A History of Aviation and Its Influence on World Events, Volume II 1946-2005* (Washington, DC: Potomac Books, Inc., 2007), 42-44.

Atomic weaponry doctrine was slow to form in the Navy, a service where written doctrine had never played a major role.¹² The technology itself was new and complex; many of its details were still highly classified and compartmented. Some officers thought the Navy should completely reorient itself around delivering nuclear bombs against the Soviet Union, challenging SAC for the mission. Some went so far as to allege improprieties in the Air Force's B-36 bomber program, in what became known as the "Revolt of the Admirals."¹³ Others minimized the impact of nuclear weapons on the Navy's traditional missions. In between were those who thought that nuclear weapons should be integrated alongside conventional weapons and missions.

In July 1947, the JCS committee evaluating Operation CROSSROADS issued its report. The committee underscored the atomic bomb's potential power and stressed the need for an atomic bomb striking force in being at all times as a deterrent to attack. The report spurred naval officers especially naval aviators, to conclude that the Navy should develop a nuclear weapons capability in earnest.¹⁴ By year's end, Rear Admiral Daniel Gallery, Assistant CNO for Guided Missiles, proposed a radical re-orientation of the Navy from its traditional sea control mission to atomic attacks against the Soviet homeland, arguing that the Navy was better suited to the mission than the Air Force.¹⁵

¹² "The Navy relied very little on written doctrine as a training tool, preferring that naval officers absorb the fundamentals of naval theory through the practice of their craft.... Although this type of unwritten dogma served the Navy very well before and during the [Second World] war, it was difficult to define and even more difficult to communicate." Rosen, *op. cit.*, 246.

¹³ The "revolt" stemmed from the Truman Administration's cancellation of the Navy's first super-carrier, the USS United States, in 1949 to divert funding to the Air Force's B-36 bomber. Navy officials struck back, alleging a conflict of interest by Secretary of Defense Louis Johnson, who previously served on the board of directors of Convair, the maker of the B-36. A congressional investigation found no evidence of impropriety by Johnson or the Air Force, but questionable behavior by the Navy. In subsequent congressional hearings, a number of admirals railed against the unification of the services into the Department of Defense, as well as the B-36, casting the Navy in a very negative light. Afterwards, CNO Denfeld and others involved in the controversy were forced into early retirement. See Jeffrey G. Barlow, *Revolt of the Admirals: The Fight for Naval Aviation, 1945-1950* (Washington, DC: U.S. Government Printing Office, 1995)

¹⁴ Rosenberg, *op. cit.*, 252.

¹⁵ *Ibid.*, 253-254.

In January 1948, Rear Admiral Ralph Ofstie, a Navy member of the joint Military Liaison Committee to the Atomic Energy Commission and former member of the JCS CROSSROADS evaluation committee, offered a more moderate vision, one that received wider Navy backing. Ofstie's concept entailed an initial wave of carrier-based atomic strikes against the Soviet Union, selectively targeting political control centers and urban and industrial concentrations in order to disrupt national organization and command structures. Then tactical targets could be attacked using conventional as well as atomic weapons. This was distinct from the Air Force approach, which effectively aimed to annihilate Soviet cities and their inhabitants on a massive scale. For Ofstie and his supporters, Navy atomic strikes should be selective and accurate to minimize collateral damage.¹⁶

The following June, the Navy's General Board, comprising some of the brightest senior line officer in the Navy and Marine Corps, released its report on the Navy's role in postwar national defense. The Board conceded that the atomic air offensive would be vital to the United States in the event of war with the USSR but did not offer carrier-based air as a major alternative to SAC. The Board argued that control of the seas, selective initiation of ground offensives, and other conventional operations also must be considered necessary elements in U.S. strategy. It also identified anti-submarine warfare (ASW) as the first mission of the carrier task forces; those forces would destroy and block "enemy submarine bases by atomic, radiological, conventional bombing or mining attacks."¹⁷

In August 1949, the Air Warfare Division of the Deputy CNO (Air), OP-55, produced a study on "The Future Development of Carrier Aviation." In contrast to the Navy Board study, OP-55 concluded that enemy air power, not submarines, was the most serious threat confronting the Navy. The study asserted that heavy attack aircraft and nuclear weapons would play only a minor role in U.S. naval aviation, and that emphasis should instead be placed on general purpose fighter and attack/close air support aircraft.¹⁸

¹⁶ Ibid., 254.

¹⁷ Rosenberg, *op. cit.*, 256-257.

¹⁸ Ibid., 261-263.

The Navy looked to nuclear weapons to supplement rather than supplant conventional weapons.

While opinions about nuclear weapons varied in the Navy at this time, it is notable that none was opposed to the adoption of such weaponry per se. The variance lay in how much emphasis to place on

the new munitions. Mainly, nuclear weapons were seen as complementing conventional weapons and missions rather than supplanting them. These views reflect the optimistic conclusions drawn from the CROSSROADS tests about the feasibility of atomic defensive measures, bureaucratic opposition to Air Force methods, and the expectation that atomic weapons would remain in short supply for the foreseeable future. This line of reasoning carried over to joint war planning in the late-1940s, whereby the Navy argued that its 6th Fleet would require conventional and nuclear bombs in order to support U.S. ground troops in Europe.¹⁹

Reflecting the growing belief that atomic energy posed no unique challenges, the Navy disbanded the CNO's Special Weapons Division by the end of 1946 and reassigned its functions to traditional line organizations. The Deputy CNO (Operations), which had control of strategic plans, was now charged with overseeing atomic energy development. The Deputy CNO (Logistics) was placed in charge of modifying aircraft carriers to handle atomic weapons, and the Deputy CNO (Air) was given responsibility over guided missile development. Disbanding the Special Weapons Division was seen as a setback by some: "...dedicated young officer ...were forced to attempt to develop a nuclear strike capability for the Navy outside its formal structure. They received aid from Vice Admiral Forrest Sherm, the Deputy CNO (Operations) and Vice Admiral Arthur Radford, the Deputy CNO (Air) but no central office directed their efforts."²⁰ It would take nearly another decade for Navy leadership to create an organization dedicated to nuclear weapons that transcended the service's traditional bureaus.

¹⁹ "Tactical support for ground forces has been a mission of the Sixth Fleet since 1948, and the Navy had argued persistently that atomic weapons as well as conventional ordnance should be used for this purpose." Ibid., 266.

²⁰ Ibid., 249.

2. Nuclear Normalization (1950s-Early 1960s)

From the 1950s to the early 1960s, the Navy, like its sister services, deployed tactical nuclear weapons widely across its general purpose forces (i.e., surface ships, attack submarines, aircraft). This deployment coincided with advances in nuclear warhead miniaturization, more plentiful fissile material, and national level guidance in the late-1940s to early-1950s that normalized nuclear weapons use in the event of war with the Soviet Union. For instance, in September 1948, President Truman approved National Security Council Directive 30 (NSC-30) which declared that the military “must be ready to utilize promptly and effectively all appropriate means available, including atomic weapons.”²¹ NSC 162/2, approved in November 1953, provided that, “In the event of hostilities, the United States will consider nuclear weapons to be as available for use as other munitions.’ This statement, approved as national policy...was seen by the JCS [Joint Chiefs of Staff] as an assurance that they could confidently plan for the use of nuclear weapons in both limited and general conflicts.”²² Upon the recommendation of Supreme Headquarters Allied Powers Europe (SHAPE), the North Atlantic Council agreed in 1954 to integrate tactical nuclear weapons into NATO’s defensive posture. Indeed, by January 1957, Chairman of the Joint Chiefs of Staff (CJCS) Admiral Arthur Radford publicly informed Congress: “Our whole military program is based on the use of atomic weapons in global war and in the use of atomic weapons in accordance with military necessity in situations short of global war.”²³

²¹ David Alan Rosenberg, “The Origins of Overkill: Nuclear Weapons and American Strategy, 1945-1960,” *International Security* 7, no. 4 (Spring 1983): 13.

²² Ibid., 31. NSC 162/2, “Basic National Security Policy” (Oct 30, 1953), available in *Foreign Relations of the United States (FRUS), 1952-1954, Vol. II* (Washington, DC: U.S. Government Printing Office, 1984), 577-597, online at https://history.state.gov/historicaldocuments/frus1952-54v02p1/pg_577.

²³ Robert Frank Futrell, *Ideas, Concepts, Doctrine: A History of Basic Thinking in the United States Air Force, 1907-1964, Vol. II*, Aerospace Studies Institute, Air University, June 1971, 418.

In making the rapid switch to dual capability, the Navy demonstrated logistical and procedural efficiency.

The Navy's integration of nuclear weapons proceeded rapidly in accordance with national policy. In 1952, an anti-submarine depth bomb version of the MK-7 atomic bomb entered the U.S. nuclear stockpile.²⁴

The following year, fissile material components for atomic weapons were placed aboard aircraft carriers.²⁵ In 1954, the Regulus nuclear-armed cruise missile entered Navy service, and within two years, it was deployed on four heavy cruisers, two submarines, and ten aircraft carriers.²⁶ Also in 1956, a 16-inch nuclear projectile for Iowa-class battleships entered service.²⁷ By year's end, declassified data shows that the Navy had nearly 300 nuclear weapons afloat. By 1958, the number would more than double to just over 750, roughly 10 percent of the entire U.S. nuclear stockpile at the time.²⁸

By this time, ballistic missile development, and fears of a Soviet advantage therein, had become a top national concern. In 1955, the Eisenhower Administration ordered the Navy to join the Army in development of an intermediate-range ballistic missile (IRBM) that could be launched from surface ships.²⁹ The Navy bureaucracy resisted on a variety of technical, bureaucratic, and financial grounds, however, and the

²⁴ Joel J. Sokolsky, *Seapower in the Nuclear Age: The United States Navy and NATO, 1949-1980* (Oxfordshire, UK: Routledge, 2021), 65.

²⁵ Rosenberg, "American Postwar Air Doctrine and Organization," *op. cit.*, 265; See also, Polmar, *Aircraft Carriers*, *op. cit.*, 44.

²⁶ Norman Polmar, "The U.S. Navy: Tactical Nuclear Weapons," *Proceedings* 109, no. 7 (July 1983): 125-126. See also, Edward C. Whitman, "Regulus: America's First Sea-borne Nuclear Deterrent," *Undersea Warfare* 3, no. 3 (Spring 2001): 32-33.

²⁷ Polmar, "The U.S. Navy: Tactical Nuclear Weapons," *op. cit.*

²⁸ U.S. Department of Defense, *Nuclear Weapons Afloat End of Fiscal Years 1953-1991*, 2015. Available at http://open.defense.gov/Portals/23/Documents/frddwg/weapons_afloat_unclass.pdf. See also, Robert S. Norris and Hans M. Kristensen, "Declassified: U.S. Nuclear Weapons at Sea During the Cold War," *Bulletin of the Atomic Scientists* 72, no. 1 (2016): 59.

²⁹ In 1955, the Soviets managed to launch a Scud ballistic missile from a surfaced submarine. Norman Polmar, "The Polaris: A Revolutionary Missile System and Concept," Colloquium on Contemporary History, U.S. Navy, Naval Historical Center, September 2003, 1.

project languished.³⁰ The arrival of a new CNO, Admiral Arleigh Burke, was pivotal in overcoming the inertia:

Fearing that the project would be given low priority within the Navy and doomed to failure if left to the existing Navy bureaucracy, Admiral Burke established a Special Projects Office (SPO). He wanted the SPO to be a “vertical” organization, separate from the existing technical bureaus, that would direct the sea-based missile project. Heretofore, all major naval technical developments, as well as production, had been directed by the technical bureaus, which had been organized in a horizontal structure since 1842. In these moves, he was strongly supported by the Secretary of the Navy, Charles S. Thomas.³¹

The SPO quickly became a Navy-only project to deploy a solid-fueled IRBM, the Polaris, on board nuclear-powered submarines. Within four years, the first such fleet ballistic missile submarine (SSBN), the *USS George Washington*, conducted the initial submerged launching of a Polaris missile. The submarine departed for its maiden nuclear deterrent patrol in November 1960. Polaris was a watershed event for the Navy. Accorded a unique vertical organization that reported directly to the CNO and Navy Secretary, the SSBN soon enjoyed top priority and status within the service.

As summarized in Table 3, the emergence of the Polaris submarine-launched ballistic missile (SLBM) brought new dimensions to the Navy’s nuclearization. Foremost, the attack carriers provided full-spectrum capability. Their ability to strike inland Soviet targets was the initial means by which the Navy claimed a role in strategic deterrence. Polaris was more survivable, however, and in time would eclipse the attack carriers’ contribution to strategic deterrence. As more SSBNs entered

³⁰ The Navy’s submariner community was opposed to ballistic missiles on safety and mission grounds. Naval aviators also were opposed, as the missiles threatened their strategic strike role. *Ibid.*, 1-2.

³¹ *Ibid.*, 2.

the fleet in 1961, five of them were dedicated to TO in support of SACEUR’s nuclear war plans, adding a survivable nuclear platform at the theater level.³² Rounding out the fleet, dual-capable surface ships and attack submarines could transition from conventional to tactical nuclear operations in support of theater needs.

PLATFORM	MISSIONS ³³			
	Strategic Deterrence	Theater Nuclear Support	Tactical Nuclear Operations	Conventional Operations
Attack Carriers	•	•	•	•
SSBNs	•	•		
General Purpose Forces		•	•	•

Table 3: Spectrum of U.S. Navy Conventional-Nuclear Capabilities, Early 1960s.

Naval thought leaders grappled with the implications of the fleet s nuclearization. The pages of *Proceedings*, the journal of the independent U.S. Naval Institute, served as the principal sounding board. A March 1957 award-winning article by a Navy commander, highly representative of Navy thinking, put forth a “Philosophy for Naval Atomic Warfare.” The

³² Memo from Roswell L. Gilpatric, Deputy Secretary of Defense, to and approved by President Kennedy, 26 July 1961; DECLASSIFIED. Available at: <https://www.jfklibrary.org/asset-viewer/archives/JFKNSF/224/JFKNSF-224-003>. The United States had a total of six Polaris submarines at the time. See also, Drew Middleton, “U.S. To Give NATO Five Submarines Carrying Polaris,” *New York Times*, May 6, 1962.

³³ “Strategic Deterrence” is defined here as the ability to deliver nuclear weapons against ta gets of national significance deep within the Soviet homeland. "Theater Nuclear Support" is the ability to deliver nuclear weapons against regional targets in a combatant command’s plan. “Tactical Nuclear Operations” is the ability to use nuclear weapons in localized, platform-to-platform combat. “Conventional Operations” form the non-nuclear baseline. Apart from self-defense using conventionally armed torpedoes, SSBNs are not intended for conventional operations.

article drew inspiration from congressional testimony by Rear Admiral Ofstie that the Navy believed “strategic air warfare as practiced in the past and as proposed in the future [by the Air Force] is militarily unsound and of limited effect, is morally wrong and is decidedly harmful to the stability of the postwar world.” Therefore, naval atomic warfare had to be militarily sound, effective, morally right, and helpful to postwar security:

Can this philosophy...be applied to all-out thermonuclear war as well as limited atomic war?

In the case of a hydrogen holocaust, the answer is “no.” By no stretch of the imagination can a global thermonuclear war be militarily sound, effective, morally right, or helpful to post-war security. It is none of these.

Notwithstanding, in the tragic event of such a war, the Navy’s philosophy should still call out weapons which are tailored to the target, which are as “clean” as technically feasible, and which are delivered by the most precise system which the atomic explosion shall permit.... Constant effort should also be expended to improve accuracy to insure a continued downward trend for the destructive force needed for a given target.

In the case of localized war, it is submitted that atomic warfare can and must be conducted in accordance with our naval heritage and in compliance with these four principles, so long as weapon design, delivery method, and type of burst are controlled. The explosive yields of tactical naval weapons should be very small. Weapon design must reduce the fallout peril to a minimum. The delivery method must always endeavor to place the weapon at the precise point of aim, and the acceptable margin of error should be limited to tens of feet. The altitude or place of burst must be compatible with the target and the surrounding areas.

In conclusion, the Navy should abide by these principles in the prosecution of naval atomic warfare:

- (1) Naval atomic warfare should be militarily sound, effective, morally right, and helpful to postwar security.
- (2) There should be no hesitation or reluctance, for either moral or historical reasons, for naval preparedness to participate

in a global atomic war. To give flexibility, mobility, and dispersion to the nation's deterrence system and to survive in the unhappy event that this deterrence system fails, the Navy must assume a significant if not a predominant role, in both the deterrence and reprisal tasks.

- (3) In both localized war and all-out nuclear war, the Navy must look to the peace which always follows. As Admiral Arthur W. Radford once said, "Victory in war is not an end in itself. The true end is a prosperous United States and a stable, peaceful world. Our military strategy must be phased to obtain that objective."
- (4) Declare that in the event of aggression, the Navy will be prepared to use precision atomic weapons. The small size and controllable yields of these weapons should be publicized, and it should be known that they can be delivered by precise methods; that the resulting explosion will not cause widespread or unrelated damage.
- (5) Continue to sponsor requirements and develop doctrine and tactics for the use of smaller, more discriminate, "cleaner" weapons to be delivered by precision methods.
- (6) Re-emphasize the Navy's philosophy and publicize the profound difference between a local war fought with precision tactical weapons and a global holocaust fought with massive weapons.³⁴

³⁴ Commander Malcolm W. Cagle, USN, "A Philosophy for Naval Atomic Warfare," *Proceedings* 83, no. 3 (March 1957): 249-258. Cagle's argument was validated in an article by Admiral H.D. Felt, the Vice CNO, "The Potential of Our Nuclear Age Navy," *Proceedings* 84, no. 1 (January 1958): 110-113. The yields of nuclear weapons subsequently deployed by the Navy generally conformed to this philosophy. Nuclear-capable general purpose platforms tended to carry low-yield weapons. Because U.S. aircraft carriers could be called upon to support missions up to striking strategic targets in the USSR, they carried "dial-a-yield" gravity bombs that varied from low-to-high kilotons. Dedicated to the strategic deterrence mission, the Navy's SSBNs carried high-yield SLBM warheads throughout the Cold War. See Kyle Mizokami, "Tactical Nuclear Weapons at Sea," *Proceedings* 146, no. 8 (August 2020). In addition, the Navy pioneered delivery of nuclear bombs by tactical aircraft using various techniques that were then adopted by the Air Force. See Admiral Arleigh Burke, CNO, "Readiness of Attack Carriers for General War," *Memorandum for the Record*, November 13, 1959, Declassified

In 1959, another award-winning *Proceedings* article made the case for “finite deterrence, controlled escalation,”³⁵ a concept credited to Admiral Burke. As an alternative to massive retaliation against Soviet urban industrial centers, as well as emerging Air Force interest in attacking Soviet bomber and missile bases, so-called blunting or counter-force attacks which would trigger an arms race, the article proposed that finite deterrence-controlled escalation set an upper limit to nuclear force sizing:

...there is a calculable upper limit upon the relatively invulnerable forces necessary to create in the mind of the Russian leaders the image of being deterred. The basic calculation is simple and starts with a count of the number of major industrial concentrations in Russia. Given this number [no more than 200] and the known damaging effect of a thermonuclear weapon of a certain yield, the number of megatons which must be delivered on target is revealed. Working backward from this figure and accounting for attrition (numbers of weapons lost while penetrating enemy defenses), less than 100% reliability, losses of “effectives” due to down time for maintenance, numbers of weapons needed to fill logistic pipelines and those needed for training, one arrives at the total number of weapons required.

Then, in a break from the massive retaliation mindset, the author posited that a more controlled escalation would be possible:

In the event the Russians accidentally initiate a general war, let us hit back instantly and hard by destroying two or three of the predesignated Russian centers. With the assurance, however, that the great majority of our forces would survive, we need not and should not immediately retaliate with the major portion of them. Instead, we should proclaim immediately which additional Russian concentration (or concentrations) will be destroyed unless their attack ceases forthwith. If the attack does not cease within the

³⁵ Commander Paul H. Backus, USN, “Finite Deterrence, Controlled Retaliation,” *Proceedings* 85, no. 3 (March 1959): 23-29.

specific time limit, the concentration is then destroyed. In effect, this policy provides for graduated and controlled retaliation. It provides room for negotiation and hopefully does not reduce entire nations to rubble.

The Navy's arguments for using Polaris in a controlled, deliberate, and selective response to a surprise attack did not sway President Eisenhower, who insisted that, "Polaris would be used primarily to 'disrupt and knock out organized defenses' in order to clear the way for SAC bombers."³⁶

In the absence of a formal doctrine for conducting nuclear warfare at sea, the Navy spoke mainly of missions and targets. As originally conceived in 1950, the Navy's nuclear-capable aircraft were to destroy the capabilities of the Soviet surface and submarine fleets in areas within a 600-mile radius of the Mediterranean, Norwegian, and Bering Seas.³⁷ This included airfields that could threaten U.S. naval forces, naval bases, ports, and submarine pens and productions facilities.³⁸ The Defense Department's influential Weapons Systems Evaluation Group (WSEG) reported favorably in early 1955 on these plans: "In addition to limiting Soviet submarine operations, the U.S. [Navy nuclear] strikes against Soviet naval bases and support facilities are expected to reduce substantially the Soviets' capability to conduct amphibious operations and to provide seaborne logistic support for their forces."³⁹

As the Sixth Fleet in particular came to play an increasingly important role in SACEUR planning, other missions were added. Thus, in 1954, U.S. aircraft carriers earmarked for SACEUR began to shift their primary focus from battlefield support to nuclear strikes against targets deep in Warsaw Pact territory, including the Soviet Union. "Upon receiving an alert signal from SACEUR, the fleet would come under his command as STRIKFORSOUTH (Allied Striking Force South). The [U.S. Navy]

³⁶ Rosenberg, "The Origins of Overkill," *op. cit.*, 63.

³⁷ Rosenberg, "American Postwar Air Doctrine and Organization," *op. cit.*, 265.

³⁸ Barlow, *op. cit.*

³⁹ Sokolsky, *op. cit.*, 59.

USN would then prepare to execute its long-range attack plans.”⁴⁰ Atomic missions for U.S. European Command strike forces, including those of the Navy, were assigned by the U.S. Element Supreme Headquarters Allied Powers Europe (SHAPE). From this mission set, SACEUR had assigned in June 1959 top priority to striking eleven political/military control centers with nuclear weapons in the event of war with the Soviet Union – and presidential authorization. Seven of these were in the Soviet Union, four in East Germany. Of these, the Sixth Fleet was responsible for attacking five of the seven control centers in the USSR ⁴¹

The Navy’s force posture in 1959 certainly reflected the importance of the nuclear strike carriers. Declassified documents show that during the May-June general alert of U.S. Navy forces around the world due to the ongoing Berlin Crisis, the Sixth Fleet put its nuclear strike forces on alert. For most of the period, two carriers were at sea in the European theater, each with at least six aircraft in immediate launch status.⁴² At year’s end, the CNO summarized the readiness of the carriers and their aircraft to conduct nuclear strike missions, as well as the number of nuclear strike targets assigned:⁴³

- On average, 2 strike carriers were ready in the Mediterranean; 2.5 in the Western Pacific
- On average, 91 attack aircraft were ready in the Mediterranean, of which 14 were all-weather (i.e., capable of carrying out nuclear strikes at night and in bad weather); 84 in the Western Pacific of which 15 were all-weather
- Sixth Fleet was assigned primary nuclear strike responsibility for 72 initial phase targets; Seventh Fleet in the Western Pacific, 152 targets
- Sixth Fleet was assigned another 37 targets in subsequent phases of general (i.e., atomic) war; Seventh Fleet, another 215 targets

⁴⁰ Ibid., 59-60.

⁴¹ Burke, *op. cit.*

⁴² Commander in Chief, United States Naval Forces Eastern Atlantic and Mediterranean, *CINCLM Annual Historical Report*, February 24, 1960, Declassified, 26. The alert posture was resumed in the 1961 Berlin crisis. See Sokolsky, *op. cit.*, 61.

⁴³ Burke, *op. cit.*

- Second Fleet was slated to move to the Norwegian Sea and prosecute 167 nuclear strike targets

Complete plans for atomic strikes by carrier aircraft were pre-positioned in the Joint Control Centers in Europe and Hawaii and were in the possession of the JCS and the Unified and Specified Commanders concerned. Overall the Navy had 1,124 nuclear weapons afloat as of 30 September 1959 - that is, before the first Polaris SSBN even put to sea⁴⁴

Backstopping this operational tempo and force posture were various activities to raise Navy nuclear awareness and practice nuclear offensive and defensive measures. For instance, as part of Exercise DESERT ROCK IV in Nevada in May 1952, Navy and Marine Corps personnel conducted an observer program and a tactical troop maneuver at the DOG nuclear test shot. About 1,950 Marines from the Marine Corps Provisional Atomic Exercise Unit participated in the tactical maneuver.⁴⁵ During the fall of 1953, NATO conducted Exercise MARINER, involving some 300 allied ships. U.S. carrier aviation conducted mock nuclear bombing runs on simulated targets in the United Kingdom.⁴⁶ In 1957, the Commander in Chief, U.S. Atlantic Fleet (CINCLANTFLT), dual-hatted as the Supreme Allied Commander Atlantic (SACLANT), instituted an atomic weapons course for allied officers and U.S. personnel attached to the Sixth and Second Fleets, as well as target training for those naval forces assigned atomic targets.⁴⁷ During Exercise CRESCENT MACE in 1959, Sixth Fleet aircraft began simulated atomic strikes against “all SACEUR and CINCSOUTH target programs” within eight hours of the “R-Hour message.” Atomic bombing support was also simulated in amphibious landings in northern Italy.⁴⁸ During April and May, Sixth Fleet also conducted the BIG DEAL STRIKEX, “a full rehearsal...of the National or NATO Atomic Strike plans. Equivalent targets in a friendly nation [were] used in lieu of actual targets. Surface Atomic Weapons replenishment [also

⁴⁴ U.S. Defense Department (2015), *op. cit.*

⁴⁵ “Operation TUMBLER-SNAPPER,” *Fact Sheet*, Defense Threat Reduction Agency, May 2015, 3. Nuclear-conventional integration by the Marine Corps is beyond the scope of this study but see, for example, Jonathan Bernstein, “Atomic Leathernecks,” Marine Corps Association, September 3, 2022, <https://mca-marines.org/blog/leatherneck/atomic-leathernecks/>.

⁴⁶ Sokolsky, *op. cit.*, 28.

⁴⁷ *Ibid.*, 60.

⁴⁸ *Ibid.*

was] conducted.”⁴⁹ Eighty-three percent of the simulated atomic targets were successfully struck.

The Navy put nuclear weapons employment criteria and defensive techniques in the hands of almost every unit commander. Nuclear weapons security and handling were routinely rated. Aircraft carriers regularly exercised nuclear strikes and were held in high states of readiness. These were significant accomplishments in training and operational preparedness.

While much of the Navy’s emphasis at this time was on offensive nuclear operations, defensive aspects also were being developed. As noted, the Navy was expected to strike critical Soviet control centers on behalf of SACEUR; mission planning for the Navy’s nuclear-capable aircraft stipulated a strike radius within 600 miles of the

Mediterranean, Norwegian, and Bering Seas.⁵⁰ This would have put the carrier strike groups at risk of attack from long-range bombers carrying nuclear-armed cruise missiles then entering the Soviet arsenal. Thus, Exercise MARINER also “presumed that nuclear weapons would be available to both sides, and tests were made on defense against atomic bomb attack on the fleet.”⁵¹ Ship dispersal presumably was the main defensive technique tested. Lack of escort vessels and maritime aircraft, inter alia, enabled aggressor force bombers to deal heavy damage against allied shipping during the exercise, indicating that much work remained to improve fleet defenses against atomic attack.⁵² Defensive armaments were also being upgraded at this time. The Terrier surface-to-air missile (SAM) was deployed on Navy cruisers beginning in 1956; the missile had a range of some 30 km and initially was armed with a conventional fragmentation

⁴⁹ CINCNELM, *op. cit.*, 24-25.

⁵⁰ Rosenberg, *op. cit.*, 265.

⁵¹ Sokolsky, *op. cit.*, 28. See also, Russell Porter, “Vast Sea Exercise to Be Atomic Test,” *New York Times*, September 13, 1953.

⁵² Isabell Campbell, “Canadian Insights into NATO Maritime Strategy, 1949-1970: The Role of National and Service Interests,” *The Northern Mariner* 25, no. 3 (July 2015): 250-251. By the early-1960s, NATO had in place detailed plans and procedures for dealing with the use of nuclear weapons against reinforcement convoys crossing the Atlantic. See “Standardization of Doctrine Against Nuclear Attack at Sea,” Memorandum for the Military Agency for Standardization, North Atlantic Military Committee, SGM-507-62, 13 September 1962; Declassified – Public Disclosed

warhead. In 1962, the Navy conducted a full test of its nuclear-armed anti-submarine rocket (ASROC), which enabled destruction of enemy submarines at greater distance and with less accuracy than conventional weapons (see Figure 7).



Figure 7: ASROC nuclear test firing, 1962. Phot credit: U.S. Government.

Overall, the Navy exhibited no hesitation about the carrier's ability to close on and attack the Soviet homeland at this time. Of course, to do so would have negated the *raison d'être* for the service's nuclear mission. The Navy's senior leadership, however, soon recognized that the mission could be better performed by a more survivable platform. By the late 1950s, CNO Burke continued

to distance the service from an emphasis on massive atomic retaliatory striking power and toward greater flexibility required to face limited aggression in remote areas of the globe. In a 1958 statement on the Navy's long-range objectives for the 1970s, he observed that although carriers would be equipped with long-range aircraft and nuclear missiles and could serve an auxiliary atomic strike function in more global conflicts the Navy's major contribution to nuclear deterrence and nuclear exchange would be in the form of ballistic missile submarines, not naval air power.⁵³

Operationally, the critical event of this period was, of course, the Cuban Missile Crisis of 1962. U.S. Navy operations during the crisis were largely conventional in focus, namely, implementing the naval quarantine of Cuba. They entailed nuclear risks nonetheless, particularly the associated tracking and harassment of Soviet submarines in the Atlantic. Unbeknown to the United States at the time, each of the four Foxtrot-class submarines operating near Cuba carried two nuclear torpedoes⁵⁴ in addition to its

⁵³ Rosenberg, "American Postwar Air Doctrine and Organization," *op. cit.*, 269.

⁵⁴ Robert S. Norris, "The Cuban Missile Crisis: A Nuclear Order of Battle, October/November 1962," A Presentation at the Woodrow Wilson Center, October 24, 2012, https://www.wilsoncenter.org/sites/default/files/media/documents/event/2012_10_24_Norris_Cuban_Missile_Crisis_Nuclear_Order_of_Battle.pdf.

conventional torpedoes. A tense U.S. Navy encounter with the Soviet submarine *B-59* on the night of 27 October 1962 reportedly led the sub's captain to consider arming a nuclear torpedo before cooler heads among his officers prevailed.⁵⁵

Admiral Robert Dennison, Commander in Chief, Atlantic Command (CINCLANTCOM), was responsible not only for the naval blockade but also for joint operational planning of the invasion of Cuba, should it be necessary. Dennison had initially requested that the invasion forces be equipped with tactical nuclear weapons but was denied by Defense Secretary Robert McNamara and the JCS.⁵⁶ Following detection of Soviet short-range, nuclear-capable FROG rockets in Cuba on October 25th, the JCS directed CINCLANTCOM on October 28th to consider whether tactical nuclear weapons should now be included for the invasion force. Dennison informed the JCS the following day that he intended to modify the invasion plans so that U.S. air and ground forces also would be armed with tactical nuclear weapons. "The JCS agree[d] to allow U.S. invasion forces to be armed with nuclear-capable weapons but specific[d] that the actual nuclear warheads should not be introduced into Cuba without further JCS authorization."⁵⁷ Thus, for example, the II Marine Expeditionary Force was ordered to be prepared to use nuclear weapons, which were carried aboard fleet shipping during the crisis.⁵⁸ Similar to the Soviet nuclear torpedoes, the United States was unaware at the time that

⁵⁵ How close the Soviet submarine captain came to arming and possibly using the torpedo is a matter of continuing controversy. See Theodore Voorhees, "The Cuban Missile Crisis at Sea – Avoidance of Nuclear War Not Left to Chance," *Naval War College Review* 76, No. 2 (Spring 2023), <https://digital-commons.usnwc.edu/cgi/viewcontent.cgi?article=8349&context=nwc-review>. 5

⁵⁶ Dan Oberdorfer, "Cuban Missile Crisis More Volatile Than Thought," *Washington Post*, January 14, 1992, <https://www.washingtonpost.com/archive/politics/1992/01/14/cuban-missile-crisis-more-volatile-than-thought/359ba0c1-1e6b-48b5-a0f2-82ceafb4262f/>.

⁵⁷ From, inter alia, *CINCLANT Historical Account of Cuban Crisis*, April 29, 1963, in "The Cuban Missile Crisis Timeline," The Nuclear Age Peace Foundation, <http://www.nuclearfiles.org/menu/key-issues/nuclear-weapons/history/cold-war/cuban-missile-crisis/timeline.htm>. As the crisis eased, the JCS appears to have removed tactical nuclear weapons from the invasion plan. See also, *The Air Force Response to the Cuban Crisis*, Undated/Redacted, USAF Historical Division Liaison Office, Headquarters, USAF, 11, <https://media.defense.gov/2019/Sep/23/2002185817/-1/-1/1/AF%20RESPONSE%20TO%20CUBAN%20CRISIS.PDF>.

⁵⁸ Major John M. Young, USMC Reserve, "When the Russians Blink: The U.S. Maritime Response to the Cuban Missile Crisis," *Occasional Paper*, History and Museums Division, Headquarters, U.S. Marine Corps, 1990, 163, https://www.usmcu.edu/Portals/218/When%20The%20Russians%20Blinked-%20The%20U_S_%20Maritime%20Response%20To%20The%20Cuban%20Missile%20Crisis.pdf.

the USSR had already deployed in Cuba nuclear warheads for the FROGs, as well as for the FKR-1 land attack cruise missiles on the island.

As the crisis mounted, all U.S. military forces worldwide were brought to defense readiness condition (DEFCON) 3, higher than normal readiness, on October 22nd. The Navy had about a half-dozen Polaris SSBNs at the time. These submarines were moved to their missile launch points that day.⁵⁹ The Polaris fleet played key roles in the contingency planning and de-escalation of the crisis. Fearing that the Soviets might retaliate for an attack on Cuba by striking the U.S. Jupiter intermediate-range ballistic missiles in Turkey, McNamara directed the JCS to draw up plans to deploy a Polaris sub off Turkey's coast prior to a U.S. attack against Cuba.⁶⁰ Indeed, the ability of Polaris to cover the Jupiter target set factored into President Kennedy's decision to trade secretly the removal of the Jupiters for the removal of Soviet missiles from Cuba and thus resolve the crisis peacefully.⁶¹

U.S. Navy analyses attribute peaceful resolution of the crisis to the overwhelming superiority of U.S. conventional and nuclear forces – both those arrayed against Cuba and the strategic nuclear triad targeted on the Soviet Union.⁶² Left unexplored in the open literature is the extent to which the Navy – and via LANTCOM, the Joint Force – were prepared to wage an integrated conventional-nuclear conflict against Soviet and Cuban forces on the island. Certainly, the Army appreciated the risk that the Soviet Il-28 bombers and longer-range ballistic missiles in Cuba

⁵⁹ Curtis A. Utz, "Cordon of Steel: The U.S. Navy and the Cuban Missile Crisis," *The U.S. Navy in the Modern World*, 1, Naval Historical Center, Department of the Navy, 1993, 28, <https://www.history.navy.mil/content/dam/nhhc/research/publications/Publication-PDF/CordonOfSteel.pdf>. On October 24th, the JCS directed SAC to raise the alert level of its bombers and ICBMs to DEFCON 2, just short of maximum readiness for war. *The Air Force Response to the Cuban Crisis*, *op. cit.*, 7-8.

⁶⁰ Walter S. Poole, Historical Office, Joint Chiefs of Staff, "The Cuban Missile Crisis: How Well Did the Joint Chiefs of Staff Work?" in *A New Look at the Cuban Missile Crisis, Colloquium on Contemporary History*, 7, June 18, 1992, <https://www.history.navy.mil/content/history/nhhc/research/library/online-reading-room/title-list-alphabetically/n/new-look-cuban-missile-crisis.html>.

⁶¹ Raymond L. Garthoff, "Soviet Actions and Reactions in the Cuban Missile Crisis," in *A New Look at the Cuban Missile Crisis, Colloquium on Contemporary History*, *op. cit.*

⁶² See, for example, "Cuban Missile Crisis," U.S. Navy, Naval History and Heritage Command, June 21, 2023, <https://www.history.navy.mil/browse-by-topic/wars-conflicts-and-operations/cuba-missile.html>. See also, Utz, *op. cit.*, 47-48.

could hit crowded staging areas in the southeastern United States with nuclear weapons and therefore pressed CINCLANTCOM to offer an invasion plan with a shorter build-up period (i.e., OPLAN 316) to limit that vulnerability.⁶³ How LANTCOM would have responded to Soviet tactical nuclear use in Cuba itself is not clear. The seeming flip-flop by the JCS and OSD over whether to factor U.S. tactical nuclear weapons into LANTCOM planning reflected the Kennedy Administration's acute concerns about potential escalation to strategic nuclear warfare, U.S. superiority notwithstanding. It would have impressed upon the Navy the limited utility of tactical nuclear weapons compared to conventional weapons.

JCS planning during the Cuban Missile Crisis likely impressed upon the Navy the limited utility of U.S. tactical nuclear weapons compared to conventional weapons.

3. Nuclear Ambivalence (Mid 1960s-1970s)

The mid-1960s through the 1970s was a time of conflicting attitudes toward nuclear weapons in the Navy. On the one hand,

nuclearization of general purpose forces (and expansion of the Polaris SSBN force) proceeded apace. On the other hand, many Navy leaders were skeptical of nuclear weapons and emphasized more flexible and therefore useable conventional forces. This Navy penchant for flexibility long preceded, but was consonant with, the shift in emphasis from nuclear firepower under the Eisenhower Administration's "New Look" at force structure to the build-up of conventional forces under the "Flexible Response" of the Kennedy and Johnson administrations. As reflected in the pages of *Proceedings*:

...the threat of a thermonuclear strike against Moscow is not a very credible deterrent to forestall border raids by Soviet-bloc puppet forces in Southeast Asia or the Middle East, because the Communists could reasonably question our will to trigger an all-out nuclear exchange, with all that it implies, in retaliation for a limited probing action.

⁶³ Jonathan M. House, "Joint Operational Problems in the Cuban Missile Crisis," *Parameters* 21, No. 1 (1991) 95, <https://apps.dtic.mil/sti/pdfs/ADA527985.pdf>.

The deterrent impact of the Navy is enhanced by its capability for discriminating, versatile operations. Units are prepared for either conventional or nuclear warfare – on and under the seas, in the air, and on the beaches. They are appropriately armed and organized for employment in a wide range of strengths. This gives to the United States the flexibility to apply force specifically tailored to the requirements of a particular situation. The recognized existence of such flexibility contributes materially to a convincing deterrent posture.

In addition, the Navy's deterrent stance is non-provocative. Since current naval deployments on a global scale have been maintained for many years, their presence in close proximity to threatened areas is now accepted as routine. There is no need to fear the danger of worsening an already bad situation by having to re-deploy. We are relieved of the hazard of precipitating an enemy attack by the hasty movement of forces from the United States to the scene of possible trouble.

...This is the essence of effective deterrence by denial – the presence of forces which would directly oppose an aggressor's penetration. This is the deterrence required to forestall limited aggression, the kind of military challenge most likely to occur.

It may well be that the Navy's role in this regard will turn out to be, in the long run, more decisive than the more widely publicized Polaris contribution.⁶⁴

Thus, by spring 1963, Navy leadership decided "that its carrier attack planes, which had been developed for nuclear strikes under the New Look concept, were inadequate for nonnuclear limited wars. Bypassing the Joint Chiefs, the Navy received [Defense] Secretary McNamara's blessing to

⁶⁴ Captain Harvey B. Seim, USN, "Naval Power and Deterrence," *Proceedings*, Vol. 87, No. 12, December 1961, 60-68.

Because their use would require presidential authorization, the Navy was unable to develop realistic battle plans for its nuclear-armed SAMs.

develop a subsonic plane with a long loiter time and a capacity to carry a large [conventional] bomb load” – the eventual A-7A.⁶⁵

At the same time, however, more and more nuclear weapons were being deployed with the general purpose forces, often without realistic use doctrine. For instance, the Terrier-BTN nuclear-armed SAM was added to the fleet in 1962. How presidential authority would be granted in time to use it against an inbound missile vexed the Navy for years to come. Also at this time, the Navy’s first nuclear torpedo, the MK-45 ASTOR, entered service. It could be launched from surface ships, submarines, and aircraft. The ASTOR’s limited range was a critical deficiency, however. Not unlike the Army’s Davy Crocket, the firing platform itself likely would be damaged by the ensuing blast.⁶⁶ Such was the Navy’s imperative to field a nuclear-armed torpedo. The B61 gravity bomb joined the fleet in 1963⁶⁷ as did a new air-delivered nuclear ASW depth bomb, the B57. The latter could be dropped by land-based maritime patrol aircraft such as the P-3, and by carrier-based aircraft such as the S-3 and the SH-3 helicopter.⁶⁸ In 1964, the Navy deployed the submarine-launched nuclear rocket (SUBROC).⁶⁹

With newer systems available, the Navy was able to retire some early nuclear weapons, such as the 16-inch shells for the *Iowa*-class battleships (1961), the Regulus cruise missile (1965), and the Mk 101 nuclear depth bomb (1971).⁷⁰ Declassified data show that the number of Navy nuclear weapons at sea, including strategic warheads on SSBNs, peaked in 1975

⁶⁵ John Schlight, *Help from Above: Air Force Close Air Support of the Army, 1946-1973* (Washington, DC: Air Force History and Museums Program, 2003), 265. The Navy’s A-7s could, however, also deliver nuclear bombs.

⁶⁶ Sokolsky, *op. cit.*, 65-66.

⁶⁷ Polmar, “The U.S. Navy: Tactical Nuclear Weapons,” *op. cit.*

⁶⁸ Sokolsky, *op. cit.*, 65. See also, Polmar, “The U.S. Navy: Tactical Nuclear Weapons,” *op. cit.*

⁶⁹ Polmar, “The U.S. Navy: Tactical Nuclear Weapons,” *op. cit.*

⁷⁰ Ibid.

at 6,191 (with 4,507 weapons in the Atlantic, 440 in the Mediterranean, and 1,244 in the Pacific – nearly a quarter of the entire U.S. nuclear weapons stockpile.⁷¹

The Navy reconciled these competing thrusts by making sure that the growing presence of nuclear weapons on its general purpose platforms would not in and of itself preclude them from a conventional mission. Rather, it would remain up to the operational commander to determine which, if any, dual-capable vessels would be withheld as a nuclear reserve.⁷² The dual-capability of U.S. and Soviet fleets meant that in any naval clash between the two, nuclear weapons likely would be present, could be lost at sea, or used. Indeed, some Western scholars raised concern that in the heat of battle, a U.S. naval commander might be tempted to use tactical nuclear weapons even without national-level approval; the Navy rejected such speculation, pointing to rigorous personnel screening and on-board launch procedures.⁷³

By contrast, some Navy officer saw strength, if not service advantage, in this dual capability. Commenting on the decision to deploy the U.S. Army to Lebanon in 1958 without its nuclear-capable Honest John rockets, one Navy officer observed in a prize-winning *Proceedings* article:

...fear of world opinion was so strong that the [U.S.] Army was not permitted to land its Honest John rockets because they had a capability of firing an atomic warhead as well as a conventional one.

⁷¹ Norris and Kristensen, *op. cit.*, 59.

⁷² This attitude was still evident in the early 1980s. As Admiral Kelso testified in 1981, “The sea launched nuclear land attack cruise missile (TLAM/N) will be deployed on general purpose forces. *This deployment will be on a not-to-interfere basis with the primary mission of these platforms....* Operations of general purpose naval forces in proximity of the Soviet coast is governed by operational requirements of the fleet commander and is not a function of whether they are carrying TLAM/N missiles.” Quoted in Desmond Ball, “Nuclear War at Sea,” *International Security* 10, no. 3 (Winter, 1985-1986): 16. Emphasis added.

⁷³ Unlike land-based nuclear weapons, U.S. sea-based nuclear weapons reportedly did not have technical locks installed. See William A. Arkin, “Nuclear Weapons at Sea,” *Bulletin of the Atomic Scientists* 39, no. 8 (October 1983): 7, and Ball, *op. cit.*, 10-11.

Psychological or political considerations which dictate the decision 'to use or not to use' [nuclear-capable delivery systems] create serious logistic and operational problems for the service arms. Divesting artillery of Honest John rockets and substituting 105mm howitzers [as in Lebanon] is just one of many. Fortunately, naval forces which are destined to spearhead military engagements in a limited sphere are not so handicapped. Carrier task forces are equipped and trained to fight equally with either "conventional" nuclear or "conventional" conventional weapons [*sic*]. Mobile logistic and underway replacement groups are capable of supporting either concept.⁷⁴

While nuclear weapon deployment peaked during this period, development of doctrine for naval nuclear warfare continued to lag. By the mid-1960s, one Navy office was able to observe, "Much has been written on weapon effects in a nautical environment as the result of nuclear weapons testing. Techniques to be employed in maneuvering and avoidance, damage control, passive defense, as well as weapon employment criteria, are in the hands of almost every unit commander."⁷⁵ Yet, there was a yawning gap between such techniques and an overarching concept for how theater nuclear conflict was to be waged. As noted in a *Proceedings* article from 1966:

Nuclear weapons developed for tactical use (guided missiles, rockets, gravity bombs, and artillery shells) have long been issued to all U.S. military services.... Their role in unifie air-sea-ground campaigns remains the subject of a doctrinal gap.

There are understandable bases for doctrinal neglect over the years: rapid changes not only in classifie data but in the overall problem itself; increasing concern for the strategic consequences of an erroneous tactical action, and security restrictions upon data essential to full understanding.

⁷⁴ Captain Carl H. Amme, Jr., USN, "Psychological Effects of Nuclear Weapons," *Proceedings* 86, no. 4 (April 1960): 27-36.

⁷⁵ Lieutenant Commander Joseph J. Bredestege, USN, "Limited Nuclear War at Sea," *Naval War College Review* 19, no. 6 (February 1967): 8.

Nothing approaching coordinated tactical nuclear doctrine can be gleaned from service publications.... Turning to Naval Warfare, NWP 10-A [1961], guidance on tactical nuclear operations must be gleaned from the general war concepts in which they are embedded. Limited conflict are not accorded separate treatment, although extensive naval building programs by potential enemies are cited as strong evidence that these are “not thinking entirely in terms of atomic [*sic*] warfare.”

Throughout the Cold War, the Navy lacked doctrine for how to wage nuclear combat at sea – how to transition rapidly from a conventional to a nuclear posture, how conventional and nuclear operations could support each other and how to prevail in mixed nuclear and conventional combat at the theater level.

Explicit warning that foes may initiate nuclear operations, no matter what constraints our forces observe, leads directly to contemplation of dual capability. Distinctly easier for more automated navies than for armies, that capability still poses problems for sea power. Apparently, operational complexities are delegated to decentralized command since, at the CNO level, the

directive is blunt rather than expository: “Naval forces must be prepared to defend themselves against all types of (mass destruction) weapons and to use them...if directed...also to conduct naval warfare successfully without these weapons...

Marine Corps manuals responsive to NWP 10-A are terse, and treat nuclear weapons matter-of-factly. War is just war, to Marines, regardless of modifying adjectives.”⁷⁶

⁷⁶ Colonel George C. Reinhardt, USA (Ret.), “The Doctrinal Gap,” *Proceedings* 92, no. 8 (August 1966): 61-69.

Absent over-arching concepts at the service or joint level, naval theater nuclear warfare “doctrine” in the 1960s-1970s remained largely a discussion of missions and targeting. In this regard, the carrier nuclear mission against in-land Soviet targets came to a gradual end. After the United States committed five Polaris SSBNs to NATO, U.S. carrier forces earmarked for SACEUR’s Program Atomic Strike Plan – which was coordinated with the U.S. Single Integrated Operational Plan or SIOP – could then shift from deep targeting of the Soviet homeland in the event of full-scale nuclear war to limited-scale tactical use of nuclear weapons in support of theater operations.⁷⁷ “Thus in his 1964 report, CINCUSNAVEUR noted that his OPLAN 222-63 had been developed as guidance for the ‘selected use of tactical nuclear weapons’⁷⁸ in support of USCINCEUR’s plans for using such weapons.” By the early-1970s, U.S. Navy airpower was relegated to the third and final stage of NATO nuclear readiness - that is, after additional SLBMs and land-based aircraft and missiles had already been placed on alert.⁷⁹ Completing this trend away from strategic targeting, the carriers were removed from the SIOP altogether in 1976.⁸⁰ Based on the gravity and anti-submarine depth bombs then in the Navy’s inventory, this re-scoping of mission meant that carrier-based nuclear air strikes would likely be limited to such targets as Soviet submarines, naval bases, and ground force concentrations.

The Navy’s Polaris SLBM may have enabled some tactical aircraft to be re-assigned from nuclear to conventional missions – an important but under-studied aspect of nuclear-conventional synchronization.

The extent to which Polaris SSBNs freed up carrier-based airpower for non-nuclear missions in NATO is not reflected in the open sources reviewed for this study. In the 1970s, the Navy increased its number of submarine-launched ballistic missile warheads

⁷⁷ Ibid., 61, 64-65.

⁷⁸ Ibid., 62.

⁷⁹ Ibid., 65.

⁸⁰ Norman Polmar, “U.S. Navy: Carrier Conundrum Continues,” *Proceedings* 127, no. 8 (August 2001): 87-88.

assigned to NATO from 80 to 400.⁸¹ This gives some sense of the number of NATO aircraft, to include U.S. carrier-based aircraft, that potentially could be relieved from nuclear duties.

By the late-1970s, the Navy's top leadership had become quite concerned with the rapid expansion of the Soviet Navy (e.g., apart from aircraft carriers, the USSR now had far more surface combatants and more than twice as many SSBNs as the United States), its evolving missions (e.g., priority destruction of U.S. SSBNs and aircraft carriers now combined with greater protection of Soviet SSBNs), and widespread deployment of tactical nuclear weapons.⁸² The latter was so worrying that the Navy now had to assess the impact of Soviet nuclear use at sea. Accordingly, in his 1978 report, CNO Admiral James Holloway observed:

- (1) If both the U.S. and Soviets are restricted to conventional weapons in the war at sea, the U.S. Navy can prevail
- (2) If both sides employ tactical nuclear weapons in the war at sea, the U.S. Navy will probably prevail, but with a thinner margin of confidence of success and with substantially greater losses at conflict determination
- (3) If the Soviet maritime forces employ nuclear weapons and the U.S. naval forces have only a conventional weapon capability, the U.S. Navy would be unable to ensure maritime superiority.⁸³

He concluded, "It is essential that the U.S. Navy maintain a capability to use tactical nuclear weapons if the United States is to be able to fight and win at sea at the highest levels of conflict. The Soviets are capable of employing tactical nuclear weapons at sea and, without a capability of its own, the U.S. Navy could not adequately deter Soviet use."⁸⁴ The Navy seemed wedded to tactical nuclear weapons as a deterrent but any notion of fighting a nuclear war at sea simply was too costly to conceive and thus

⁸¹ Raymond L. Garthoff, *Détente and Confrontation: American-Soviet Relations from Nixon to Reagan* (Washington, DC: The Brookings Institution, 1985), 850.

⁸² Admiral James L. Holloway III, USN, *CNO Report*, March 1978, 33-40.

⁸³ *Ibid.*, 17-18, 73.

⁸⁴ *Ibid.*, 13.

doctrine for it languished. This is the situation Admiral Thomas Hayward inherited when he succeeded Holloway as CNO in 1978.

4. Strategic Renaissance (Late 1970s-Early 1990s)

Under new leadership in the late 1970s and early 1980s, the Navy began to come to terms with the complexities of nuclear conflict at sea. As noted in the pages of *Proceedings*, the reckoning was overdue:

Believing that its prized aircraft carriers could not survive a nuclear attack, the Navy had for decades neglected investment in means of hardening its ships against nuclear weapons effects.

The major problem in determining an appropriate role for the surface fleet in nuclear war seems to have been the unwillingness or inability of the Navy to come to grips with

the implications of surface fleet vulnerability to nuclear weapons, particularly the vulnerability of the large, high-value aircraft carriers, which are one of the primary *raison d'être* of the rest of the surface fleet. These multibillion-dollar targets are suspected of being essentially undefendable in the face of a Soviet nuclear strike against them.

The questionable survivability of the surface fleet, however, has meant that, from the U.S. Navy point of view, expending resources on fleet nuclear readiness or preparedness has generally been viewed as nonproductive. This has led to a real contradiction in the current nuclear “condition” of the U.S. surface fleet: there is today a large capital investment in nuclear weapons in the surface fleet. In addition, a substantial amount of O&M [operations and maintenance] and people costs are incurred each year for maintenance and security of these inventories.... Aside from hardware, however, there is little else in the way of capability or interest in nuclear warfare. The Navy has developed very little in the way of doctrine, tactics, strategy, or policy for the use of its capabilities. Further, there is almost no training for warfighting either in support of a land theater nuclear war, in a nuclear

war limited to the ocean theater, or in a general nuclear war. There are very few U.S. studies of such warfighting and the problems it presents for the surface fleet, from either the U.S. or the Soviet perspective.⁸⁵

As Captain Linton Brooks observed in another *Proceedings* article:

There are many illustrations of our neglect. The senior course at the U.S. Naval War College – an institution whose stated mission is to “enhance the professional capabilities” of future military leaders and to develop “advanced strategic and tactical concepts for the future employment of naval forces” – contains essentially nothing on any aspect of tactical nuclear weapons employment. *Sea Plan 2000*, now enshrined as the principal articulation of the Navy’s vision of a future war, pictures a global contest between the United States and the Soviet Union in which nuclear weapons play no part. Debates on aircraft carrier vulnerability almost invariably focus on only conventional attacks. Senior officers discussing the possibility of war and the course such a war might take, speak of the need to hold violence below the point at which the war “goes nuclear.” We speak and act as though war could have three possible outcomes: we win, we lose, or the war “goes nuclear.” But what

⁸⁵ Joseph D. Douglass, Jr., and Amoretta M. Hoeber, “The Role of the U.S. Surface Navy in Nuclear War,” *Proceedings* 108, no. 1 (January 1982): 57-63. Behind the scenes, NATO was embarking on its first real study of maritime nuclear warfare. In March 1977, NATO Secretary General Joseph Luns endorsed the recommendation of the Alliance’s Nuclear Planning Group (NPG) to undertake a study specifically on naval nuclear warfare in the NATO area. See “Nuclear Planning Group Study of Maritime Nuclear Warfare in the NATO Area: Report by Permanent Representatives,” NPG/D(77)2, March 28, 1977; Declassified – Publicly Disclosed. The study would build on carefully constrained scenarios developed previously by the NPG. See “Nuclear Planning Group Studies of Follow-on Tactical Use of Nuclear Weapons – ACLANT Area: Report by the Permanent Representatives,” NPG/D(703)1, April 17, 1973; Declassified – Publicly Disclosed. By virtue of its SACLANT responsibilities, the U.S. Navy would have been involved in these analytical efforts.

happens once that nuclear boundary is crossed is a possibility we have set aside in our thoughts and in our planning.⁸⁶

Emerging as one of the Navy's top thinkers, Captain Brooks began to move the Navy beyond its nuclear ambivalence by offering practical suggestions:

The addition of nuclear weapons would add yet another dimension to any future war. Such a war would be so different from our past experience that we can picture it only with great difficulty thus, we have been unable or unwilling to make adequate mental and physical preparations for it. But sooner or later we must face the implications of naval nuclear war. We may consider several preparations:

- New U.S. systems should be hardened to the maximum degree practical against blast and, above all, EMP. This is most immediately applicable to the Aegis air defense system but also has broader applications.
- U.S. air defense doctrine should be reexamined with the view toward improving our ability to conduct anti-air warfare and defend carrier battle groups in an environment where communications are severely degraded.
- The utility of close-in weapon systems based on gunfire should be reconsidered, because [nuclear] weapons bursting outside their engagement range may still result in ship losses. We should not forget that, because of Soviet concern with defending their own nuclear-powered ballistic missile submarines, our ASW frigates may be high priority targets and will need to be able to defend themselves [against nuclear attack].

⁸⁶ Captain Linton F. Brooks, USN, "Tactical Nuclear Weapons: The Forgotten Facet of Naval Warfare," *Proceedings* 106, no. 1 (January 1980): 28-33. Brooks went on to various senior positions in the U.S. government dealing with nuclear weapons issues. See "Ambassador Linton F. Brooks, Distinguished Research Fellow," Center for the Study of Weapons of Mass Destruction, National Defense University, <https://wmdcenter.ndu.edu/Media/Biographies/Bio-View/Article/637743/ambassador-linton-f-brooks/>.

- We should reconsider our present forward deployment policy, particularly in the Mediterranean. We must almost certainly grant the Soviets the first blow; preemption is not the U.S. style. Our confidence that our carriers can survive this first strike rests, in part, on the assumption that the war will be conventional, at least at its outset. It might be a wiser policy to keep one of the two Atlantic Fleet carriers now deployed to the Mediterranean out of range of Soviet land-based air, despite the obvious political and operational problems associated with such a redeployment.
- We should think through what action we might take in time of crisis to counter the threat of the “Charlie”-class nuclear-powered guided missile submarine...even to the point of announcing that ships within a certain distance of our forces will be attacked and driven off. The consequences of this are, of course, exceptionally serious, and we may well decide that the drawbacks outweigh the gains. But we need to think about it nonetheless.
- We should consider developing a defense against tactical ballistic missiles.
- Finally, we should spread out our offensive power by equipping as many surface ships and submarines as possible with cruise missiles for both antiship and land attack. This is not a call for us to abandon the carrier’s preeminent place in the fleet. Our investment in carriers makes such a course impractical, and the unparalleled flexibility of sea-based aircraft in a wide spectrum of conflict makes such a course unwise. But concentrating our offensive power in a small number of high-value ships may make the use of nuclear weapons at sea more attractive to the Soviets, particularly if they lack the ability to counter the carriers with conventional weapons alone. Proliferating platforms with

offensive punch should lessen Soviet incentives for using nuclear weapons and improve our prospects if they do.⁸⁷

Propelled by such thinking, Navy leaders launched a reorganization. CNO Thomas B. Hayward created a new division in OPNAV, Theater and Strategic Nuclear Warfare (OP-65), headed by Admiral Powell Carter. As Carter explained to Congress, OP-65 would, “take the fragmented Navy nuclear weapons program and try to pull it together into one focal point to have continuity and development of a strategy.”⁸⁸ The CNO also established a new program manager, PM-23, in the Naval Materiel Command to address naval nuclear warfare. As one Navy office put it, “These efforts have produced an institutional advocacy for the ability to use nuclear weapons at sea....”⁸⁹ The CNO also created a Strategic Studies Group (SSG) at the Naval War College to promote more rigorous thinking about nuclear and other forms of naval conflict

Thus, Admiral Carter spoke to Congress of important studies and reviews underway at various levels on the Navy’s tactical nuclear weapons posture.⁹⁰ This included a study by the Office of the Secretary of Defense,

⁸⁷ Captain Linton F. Brooks, USN, “Tactical Nuclear Weapons: The Forgotten Facet of Naval Warfare,” *Proceedings* 106, no. 1 (January 1980): 28-33. With regard to cruise missiles, Brooks was echoing the November 1979 recommendation of a Defense Science Board Task Force: “Putting long-range cruise missile on more platforms (surface and sub-surface) has important merits especially for nuclear delivery (because it could provide widely dispersed nuclear offensive capability probably at moderate cost) and it may also offer important advantages for non-nuclear contingencies especially used in close coordination with manned aircraft.” *A Report of the Defense Science Board Task Force on Strategic Planning and the Maritime Experience: An Experiment*,” Office of the Under Secretary of Defense for Research and Engineering, November 1979, 17-18

⁸⁸ “Briefing by Adm. Powell Carter, Director of Theater and Strategic Nuclear Warfare, Staff of the Chief of Naval Operations,” *Hearings on Military Posture and H.R. 6495 [H.R. 6974], Department of Defense Authorization for Appropriations for Fiscal Year 1981 Before the Committee on Armed Services, House of Representatives, Ninety-Sixth Congress, Second Session, Research and Development, Title II* (Washington, DC, U.S. Government Printing Office, 1980), 2315

⁸⁹ Lieutenant Commander T. Wood Parker, USN, “Theater Nuclear Warfare and the U.S. Navy,” *Naval War College Review* 35, no. 1 (January-February, 1982): 3. In 1984, Parker would become the OpNav action officer for the *Maritime Strategy*. See John D. Hattendorf, “The Evolution of the U.S. Navy’s Maritime Strategy, 1977-1986,” *Naval War College Newport Papers*, No. 19, 2004, 86.

⁹⁰ “Briefing by Adm. Powell Carter,” *op. cit.* The Naval Research Advisory Committee conducted a study of the Navy’s tactical nuclear capabilities during the summer of 1982. See Polmar, “The U.S. Navy: Tactical Nuclear Weapons,” *op. cit.*

which reportedly concluded in early 1981 that the Navy should proceed with tactical nuclear weapon modernization.⁹¹ A study by the Navy Research Advisory Committee followed in 1982. These studies generally urged the Navy to “increase Navy-wide awareness of Soviet nuclear capabilities and doctrine; conduct more realistic fleet exercises which place more emphasis on [tactical nuclear] employment concepts; increase shipboard chemical-biological-radiological (CBR) defense; and develop more realistic career programs for naval officers specializing in nuclear weapon fields.”⁹²

To understand better the dynamics of naval nuclear combat, the Navy developed new analytical tools. In 1980, Johns Hopkins University Applied Physics Laboratory delivered to OP-65 the “Naval Nuclear Warfare Simulation.” The computer simulation was designed to test the outcome of theater-wide naval conflict and nuclear weapons requirements. It focused on Red vs. Blue attack and ballistic missile submarine operations.⁹³

Despite some remedial efforts, hardening of vessels against nuclear weapons effects remained a serious gap for the Navy.

The Navy also started to devote “extra effort” to harden its ships, aircraft, and equipment against nuclear attack.⁹⁴ Requirements were established to harden for each nuclear effect. According to David Levine of the Theater Nuclear Warfare Program

Office (PMS-423), the CG-47 Ticonderoga-class cruiser was hardened against some nuclear effects and, “This important hardening experience will be of great benefit in the design and production of the DDG-51 (Arleigh Burke) class of [destroyers], which will be the premier nuclear-survivable ships built for the Navy.”⁹⁵ In 1984, the Navy unveiled the

⁹¹ Arkin, *op. cit.*, 6.

⁹² Polmar, “The U.S. Navy: Tactical Nuclear Weapons,” *op. cit.*

⁹³ Hilary D. Burton, et al., *An Inventory of Wargaming Models for Special Warfare: Candidate Applications for the Infusion of Human Performance Data*, Lawrence Livermore National Laboratory, November 1, 1988, 195.

⁹⁴ Elise Bliss, “Fleeting Hardening: Responding to the Nuclear Threat,” *All Hands*, April 1987, 30-31.

⁹⁵ *Ibid.*

Theater Nuclear Warfare Naval Training Plan (NTP). The NTP authorized production of a series of eleven videotaped lectures or movies to raise awareness of theater nuclear warfare. The first three movies, all derived from unclassified sources, were “Nuclear Warfare At Sea,” “Nuclear Weapons Effects at Sea,” and “Nuclear Defense At Sea.” The CNO mandated that the movies be viewed by all hands.⁹⁶

In terms of force posture, the Navy entered the 1980s with fewer tactical nuclear weapons and ships certified to carry them following retirements in the late 1970s and early 1980s.⁹⁷ That left it with aging nuclear weapons in need of replacement, such as the anti-submarine SUBROC and ASROC, as well as the Terrier SAM. Development of replacement systems had been stalled by the Carter Administration, which questioned the utility of naval tactical nuclear weapons and their impact on strategic arms control with the USSR.⁹⁸ Of the replacements and other systems under consideration, such as a nuclear warhead for the long-range Phoenix air-to-air missile, only the nuclear variant of the Tomahawk Land-Attack Missile (TLAM/N) reached deployment. Notwithstanding, the general purpose forces retained substantial nuclear capability. By the mid-1980s, some 190 warships – roughly one-third of the U.S. fleet – were certified to carry nuclear weapons of various types. On average, the Navy maintained 5,340 nuclear weapons afloat during the 1980s (roughly 20 percent of the entire U.S. nuclear stockpile), including strategic warheads carried by SSBNs.¹⁰⁰

With a reach well beyond carrier-based air, the 2,500-km-range TLAM/N opened up new possibilities for the Navy and for U.S. nuclear war planning. From the mid-1970s, the United States increasingly recognized the Soviet potential to wage large-scale nuclear war, recover, and dominate the post-war environment. This concern led President Richard Nixon to

⁹⁶ Joan W. Shafer, “Nuclear Warfare Videos: Film Series to Train Sailors Into the Next Century,” *All Hands*, April 1990, 12.

⁹⁷ Polmar, “The U.S. Navy: Tactical Nuclear Weapons,” *op. cit.*

⁹⁸ Arkin, *op. cit.*, 6.

⁹⁹ Ball, *op. cit.*, 13.

¹⁰⁰ Norris and Kristensen, *op. cit.*, 59.



Figure 8: USS Merrill test launches Tomahawk cruise missile, March 1980. Photo credit: Robert Hurst.

revise U.S. policy for the employment of nuclear weapons under National Security Decision Memorandum 242.¹⁰¹ To ensure that sufficient U.S. nuclear forces would be available after the SIOP was executed, a Nuclear Reserve Force (NRF) was designated. The United States believed that by demonstrating it had a credible post-SIOP nuclear capability, the Soviet Union would see no advantage in nuclear war and therefore deterrence would be bolstered by the NRF.¹⁰² As a new military capability outside the SIOP-committed triad of ICBMs, SLBMs, and long-range bombers, TLAM/N deployed widely on surface ships and submarines was an attractive candidate for the NRF.

¹⁰¹ "NSDM 242 – Policy for Planning the Employment of Nuclear Weapons," *Memorandum for the President*, January 28, 1975, National Archives, Declassified

¹⁰² *TLAM/N in the Nuclear Reserve Force: Alternative Concepts*, Science Applications International Corporation (SAIC), 29 July 1983, 3-1, Redacted/Declassified

In 1981, Admiral Frank Kelso, then-Director of the Submarine Division in the Office of the CNO, testified to Congress that the Navy would, in fact, keep the TLAM/N outside of the SIOP and NATO's full-scale nuclear strike plan. Instead, it would be a theater nuclear weapon deployed on Navy general purpose forces, available for selective release as a non-SIOP option. Kelso also confirmed that, "in a post-SIO environment, it will contribute to the strategic reserve force."¹⁰³ TLAM/N thus extended the nuclear mission of the general purpose forces into the realm of strategic deterrence, as summarized in Table 4.

The negative impact of TLAM/N on Soviet defense planning was made clear by the Soviet high command itself. In a 1987 Pentagon visit with his counterpart CJCS Admiral Crowe, Marshal Sergei Akhromeyev complained about the pressure the U.S. military was applying against the Soviet Union. He presented a map of the USSR upon which TLAM/N range arcs were prominently displayed.¹⁰⁴

¹⁰³ Quoted in Ball, *op. cit.*, 14-15.

¹⁰⁴ Commander Paul S. Giarra, USN (Retired), "Time to Recalibrate: The Navy Needs Tactical Nuclear Weapons...Again," *Proceedings* 149, no. 7, <https://www.usni.org/magazines/proceedings/2023/july/time-recalibrate-navy-needs-tactical-nuclear-weapons-again>.

PLATFORM	MISSIONS			
	Strategic Deterrence	Theater Nuclear Support	Tactical Nuclear Operations	Conventional Operations
Attack Carriers	•	•	•	•
SSBNs	•	•		
General Purpose Forces		•	•	•
General Purpose Forces: TLAM/ N-equipped	•	•	•	•

Table 4: Spectrum of U.S. Navy Conventional-Nuclear Capabilities, Mid-1980s.

TLAM/N also brought new complexity to nuclear-conventional synchronization in the Navy. In essence, surface ships and attack submarines equipped with the long-range system had to be available to provide limited nuclear use options in a theater conflict and survive a global nuclear exchange in order to constitute a NRF. They also had to fulfil their primary conventional missions. Detailed and systematic study was required to identify trade-offs among these three missions and to optimize force postures and operational concepts.¹⁰⁵ In the end, decisions on how TLAM/N platforms were to be assigned rested with the theater commander who had operational control over them.¹⁰⁶

¹⁰⁵ SAIC, *op. cit.*, Ch. 7.

¹⁰⁶ Ball, *op. cit.*, 15-16. Command and control for TLAM/N ran from the National Command Authorities to the Theater/Unified Commander to the Naval Component Commander and then the Numbered Fleet Commander. From there it carried on to the Submarine Operational Authority (for attack submarines) or the Battle Group Commander (for surface ships), and finally the Launch Platform Commanding Office. Nuclear targeting for TLAM/N normally was performed by the staff of the Theater Commander. See SAIC, *op. cit.*, Appendix C.

The Navy's closer look at naval nuclear conflict coincided with two other major developments – a reinterpretation of Soviet naval priorities and a fundamental reorientation of U.S. naval strategy. Beginning in the early-1970s, analysts at the Center for Naval Analyses (CNA), an independent research outfit funded by the Navy, sensed that the Soviet Navy was in transition. It was not posturing primarily to interdict shipping from the United States to Western Europe in the event of war, as the U.S. Navy expected, but rather to defend Soviet SSBNs hiding in undersea bastions near the Soviet mainland.¹⁰⁷ CNA analysts assessed that, “the Soviets intended to withhold their SLBM force during the conventional stage of a war in order to provide either a second strike capability or to retain a bargaining chip during negotiations.”¹⁰⁸ In time, the Office of Naval Intelligence and the broader U.S. Intelligence Community reached the same conclusion.¹⁰⁹ With a newfound appreciation of Soviet naval priorities, the CNO directed the creation of a cell in each major command to spread these insights throughout the Navy.¹¹⁰

Aided by outsiders, the Navy changed its long-held view about Soviet naval priorities, demonstrating an institutional ability to learn and adapt.

CNA further advised, “If the U.S. Navy is to carry out its primary functions in deterrence, escalation, and warfighting it must attack Soviet *strategy* as effectively as Soviet weapons.”¹¹¹

It called for the Navy to adopt a conventional force campaign against the Soviet SSBN force in the belief that by denying the USSR its nuclear reserve and associated bargaining leverage, it could deter the Soviet Union from starting or escalating a conflict. In essence, by holding at risk certain Soviet strategic nuclear forces, CNA saw a means to increase the deterrent effect of the

¹⁰⁷ Hattendorf, *op. cit.*, 24-29.

¹⁰⁸ *Ibid.*, 27.

¹⁰⁹ *Ibid.*, 29-34, and Appendix I, *Soviet Naval Strategy and Programs through the 1990s*, National Intelligence Estimate, NIE 11-15-82/D, 15 November 1982. Approved for Release, CIA Historical-Review Program. Accession number NN3-263-95-001, 31 Jan 1995.

¹¹⁰ Hattendorf, *op. cit.*, 35.

¹¹¹ CNA analyst Bradford Dismukes quoted in *Ibid.*, 28. Emphasis added.

U.S. Navy's general purpose forces.¹¹² It was a novel, albeit controversial, take on nuclear-conventional synchronization, one not reflected in Army or Air Force thinking.

The anti-SSBN campaign, as it became known, was consistent with an emerging Navy consensus that a more pro-active posture was necessary. As Admiral Hayward illuminated in his "Strategic Principles":

The U.S. Navy must be offensively capable. The Soviet Navy is sophisticated and highly capable, but the U.S. Navy can only assure control of essential sea areas by the destruction or neutralization of the Soviet Navy's capability to challenge that control. This requires taking the war to the enemy and retaining residual power after the battle.

The U.S. must capitalize on the Soviet Union's geographical disadvantages and its defensive mentality. This means maintaining a potential U.S. Navy threat to the Soviet Union, making the Soviets understand that in a war there will be no sanctuaries, and drawing the Soviets into a preoccupation with homeland defense and operations close to the Soviet Union which will preclude the availability of Soviet forces to attack Western sea lines of communication.¹¹³

A 1981 Secretary of Defense Policy and Capabilities Review reached a similar conclusion:

...planning for a global war required a new pattern of thinking that developed an integrated regional approach, with revised strategy and force priorities. Offensive combinations of force were needed to exploit vulnerabilities and to unbalance Soviet strategy. In this, anti-SSBN operations...appeared to be promising. In considering a global war, it would be important...to deny the Soviets means of

¹¹² Ibid., 28.

¹¹³ Ibid., 38.

escalating the conflict. This would be a key factor in controlling the war to the advantage of the United States, keeping it global, but conventional.¹¹⁴

By pursuing a conventional ASW campaign against Soviet SSBNs, the Navy's intent was to demonstrate that its general purpose forces could manipulate the Soviet decision calculus – to make nuclear escalation and war termination bargaining seem less attractive to Moscow, thereby helping to deter the outbreak of war.

In the fall of 1981, the recently created SSG conducted two war games to help reorient Navy thinking. The dominant paradigm was that of Warsaw Pact numerical superiority over NATO, particularly with regard to ground forces in central Europe. A driving consideration for the SSG thus was “whether there might not be some better way to influence the outcome [of a war in Europe] than merely [by] helping the Army to lose more slowly.” The SSG saw that the Navy’s “ability to operate

with relative impunity in the upper reaches of the Norwegian Sea, against Soviet SSBNs, and against the Balkan industrial base from the Eastern Mediterranean” might make a difference.¹¹⁵ The basic issue “was to take the defeat of Soviet strategy as the central frame of reference for American military strategy rather than to derive a strategy from American national interests alone.”¹¹⁶

Additional war games followed in 1982 and 1983. They were “no holds barred, true all-source...with the highest level of participation”¹¹⁷ and developed many useful insights primarily for the use of attack submarines against Soviet SSBNs. The games also “found that the most significant utilization of the aircraft carrier was as a ‘tactical nuclear reserve’ to tie

¹¹⁴ Ibid., 52.

¹¹⁵ Ibid., 53-54.

¹¹⁶ Ibid., 54.

¹¹⁷ Ibid., 35.

down significant numbers of Soviet air assets while remaining beyond their effective reach just below the Greenland-Iceland-United Kingdom gap, until that point in a war when it became necessary to negotiate with the Soviet Union whether the war could be terminated or would escalate to a nuclear war.”¹¹⁸ This was the flip side of the anti-S BN campaign, using the nuclear strike threat posed by U.S. aircraft carriers to tie up Soviet conventional forces that could otherwise support a Soviet land offensive against NATO. These ideas were compatible with the forward, offensive posture sought by the Navy’s top leadership, including Secretary John Lehman, which became codified in the *Maritime Strategy* approved by Lehman and CNO Admiral James Watkins in late 1982.

Openly published in 1986, the *Maritime Strategy* entailed three sequential phases: I. “Deterrence or the Transition to War,” II. “Seizing the Initiative,” III. “Carrying the Fight to the Enemy.” The more offensive, forward nature of the strategy was clear: “If war comes, we will move into the second phase of the strategy in which the Navy will seize the initiative as far forward as possible. Naval forces will destroy Soviet forces in the Mediterranean... and fight our way toward Soviet home waters.”¹¹⁹ The determination to hunt down Soviet SSBNs was equally explicit: “As the battle groups move forward, we will wage an aggressive campaign against all Soviet submarines, including ballistic missile submarines.”¹²⁰ The strategy also featured the integration of sister services, allied forces, and dual-capable platforms: “...we must move carriers into positions where, combined with the U.S. Air Force and allied forces, they can bring to bear the added strength needed on NATO’s Northern or Southern flank The strike power of carrier battle forces can also be augmented with conventional land-attack Tomahawks launched from submarines or surface ships. All of these would be brought to bear as the unified commanders direct.”¹²¹

¹¹⁸ Ibid.

¹¹⁹ Admiral James D. Watkins, USN, “The Maritime Strategy,” *Proceedings* 112, no. 1 (January 1986): 2-17.

¹²⁰ Ibid.

¹²¹ Ibid.

The *Maritime Strategy* offered a vision and rationale for the integrated application of conventional and nuclear force:

The tasks in [Phase III] are similar to those of earlier phases, but must be more aggressively applied as we seek war termination on terms favorable to the United States and its allies. Our goal would be to complete the destruction of all the Soviet fleet which was begun in Phase II.... At the same time, antisubmarine warfare forces would continue to destroy Soviet submarines, including ballistic missile submarines, thus reducing the attractiveness of nuclear escalation by changing the nuclear balance in our favor.

The Soviets place great weight on the nuclear correlation of forces, even during the time before nuclear weapons have been used. Maritime forces can influence that correlation, both by destroying Soviet ballistic missile submarines and by improving our own nuclear posture, through deployment of carriers and Tomahawk platforms around the periphery of the Soviet Union. Some argue that such steps will lead to immediate escalation, but escalation solely as a result of actions at sea seems improbable, given the Soviet land orientation. Escalation in response to maritime pressure serves no useful purpose for the Soviets since their reserve forces would be degraded and the United States' retaliatory posture would be enhanced. Neither we nor the Soviets can rule out the possibility that escalation will occur, but aggressive use of maritime power can make escalation a less attractive option to the Soviets with the passing of every day.

The real issue, however, is not how the *Maritime Strategy* is influence by nuclear weapons, but the reverse: how maritime power can alter the nuclear equation. As our maritime campaign progresses, and as the nuclear option becomes less attractive, prolonging the war also becomes unattractive, since the Soviets cannot decouple Europe from the United States and the risk of

escalation is always present. Maritime forces thus provide strong pressure for war termination that can come from nowhere else.¹²²

The notion of intentionally attriting Soviet SSBNs unnerved many outside critics of the *Maritime Strategy*. John Mearsheimer, a University of Chicago professor, claimed “three principal flaw are apparent in arguments that an anti-SSBN offensive strategy would produce deterrence stability by shifting the strategic balance: (1) American political leaders may not allow the Navy to execute the strategy; (2) the Navy may not be capable of implementing it effectively; and (3) a successful anti-SSBN campaign may not coerce the Soviets into better behavior, since the Soviets would have options other than standing down, including escalation on their part.”¹²³ Barry Posen, then a Postdoctoral Fellow at Harvard, was particularly focused on the risk of escalation. In his view, conventional attacks by U.S. submarines against Soviet SSBNs or conventional attacks against critical Soviet Northern Fleet facilities by U.S. carrier-based aircraft could raise Moscow’s fears of a disarming first strike and trigger Soviet use of nuclear weapons on naval targets:

...survivable strategic nuclear forces are critical to the security of both superpowers. States fight hardest – and may be willing to risk the most dire consequences – when assets essential to the preservation of their sovereignty are at stake. Thus, conventional operations that threaten strategic nuclear forces can be extremely provocative. Both sides are frightened of nuclear weapons, and seem in no hurry to use them. However, although it may seem paradoxical, the use of some nuclear weapons to protect the remainder of one’s strategic deterrent is probably among the most plausible scenarios for nuclear escalation. Such escalation is unlikely to be easy to manage or control.¹²⁴

¹²² Ibid.

¹²³ John J. Mearsheimer, “A Strategic Misstep: The Maritime Strategy and Deterrence in Europe,” *International Security* 11, no. 2 (Fall 1986): 53.

¹²⁴ Barry R. Posen, “Inadvertent Nuclear War? Escalation and NATO’s Northern Flank,” *International Security* 7, no. 2 (Fall 1982): 49.

Inadequate consideration of nuclear escalation risks and how to manage them was another major gap for the Navy.

More broadly, detractors charged that the *Maritime Strategy* was incomplete, lacked coherence, and was intentionally vague to provide the Navy with multiple rationales to lobby for increased resources while also deflecting criticism¹²⁵

Concerns about the *Maritime Strategy*'s inadequate attention to nuclear escalation also were voiced within the Navy. In a 1984 *Proceedings* article, Captain Brooks, then Deputy Director of the Strategic and Theater Nuclear Warfare Division observed:

...between superpowers, the need to control escalation in order to survive makes all future wars either limited or suicidal. This need for escalation control imposes two new requirements on military strategy:

- The strategy should not lead to unwanted escalation.
- The strategy should not fail catastrophically should escalation occur.

These two principles join a long list of criteria – decisiveness, risk, economy of force, etc. – against which a particular strategy must be evaluated.

In the strict sense, there can be no such thing as a maritime or naval strategy in today's world, any more than can there be separate land strategies or nuclear strategies. The emergence of air power and joint operations in World War II doomed separate land and sea strategies; the concept of escalation control has doomed separate conventional and nuclear ones. Still, it is useful to examine the components of national strategy separately.

¹²⁵ Mearsheimer, *op. cit.*, 3-4, 17-25.

With this [Soviet] image of aircraft carriers [as U.S. nuclear delivery systems] and the apparent Soviet assumption that the West will be forced to use nuclear weapons first in a NATO-Warsaw Pact war, carriers approaching within strike range of the Soviet Union may be perceived as preparing to launch nuclear strikes. The Soviets, who stress preemption, may elect to beat us to the draw. Thus, forward operation of carrier battle groups seems inconsistent with the first criterion of not inducing escalation.

Forward operations are inconsistent with the second criterion as well. Should escalation occur, the strategy will indeed fail catastrophically. U.S. carriers will be exceptionally vulnerable, subject to attack from multiple azimuths where anything less than a leak-proof defense results in failure. The situation is exacerbated today because many important programmed improvements in fleet air defense are still in the future.¹²⁶

For Brooks, the implications for carrier air were clear, even if they contradicted the *Maritime Strategy*:

Recommended Read: Brooks, "Escalation and Naval Strategy," Proceedings, August, 1984.

...the principal mission of carriers in the early stages of a major war is survival. They form an

irreplaceable strategic reserve, whether the war remains conventional or escalates...the carrier can perform her decisive role later in the war only if she has not been squandered earlier.

The notion of using the Navy's most visible force as a strategic reserve, whose initial function is to remain out of harm's way, is foreign to the aggressive attitude of successful naval commanders. In addition, gaining congressional support for complex and capable

¹²⁶ Captain Linton F. Brooks, USN, "Escalation and Naval Strategy," *Proceedings* 110, no. 8 (August 1984): 33-37.

ships that will be employed in a reserve role will be difficult. These drawbacks, however, argue for deeper study and better articulation of the concept, not its rejection.

...to ensure the second escalation criterion – strategy should not fail catastrophically – is met, the ability of carrier battle groups to survive, operate, and fight in a nuclear environment must be improved.

Improved training, tactics, survivability, hardening, and capabilities against nuclear-armed cruise missiles provided by nuclear SM-2 surface-to-air missiles are essential.... Since hardening improvements will be slow in coming, the Navy should consider grouping those ships that have had survivability improvements into nuclear-capable battle groups. Initially, it may prove wise to have all such battle groups positioned in the Atlantic Ocean where there is the least choice about forward operations.

The U.S. Navy's declaratory policy need not avoid a proclaimed willingness to operate in Soviet waters. It is both wrong and dangerous to give the Soviets the impression that we will cede any area of the world to them by default. The danger, however, is that the U.S. Navy will become a victim of its own rhetoric. Since naval leaders are uncomfortable with the concepts of escalation and of nuclear war, they may find themselves accepting a high probability of escalation, not as a conscious, calculated risk, but because they have failed to think through the problem.¹²⁷

Brooks' views on not deploying carriers forward against the Soviet Union were echoed by other U.S. Navy officers¹²⁸

¹²⁷ Ibid.

¹²⁸ See, for example, Commander Raymond E. Thomas, USN, "Maritime Theater Nuclear Warfare: Matching Strategy and Capability," in *Essays on Strategy: Selections from the 1984 Joint Chiefs of Staff Essay Competition* (Washington, DC: National Defense University Press, 1985), 50; Lieutenant Commander Alan D. Zimm, USN, "The First Salvo," *Proceedings* 11, no. 2 (February 1985): 55-60; and Commander Richard T. Ackley, USN (Retired), "No Bastions for the Bear: Round 2," *Proceedings* 111, no. 4 (April 1985): 42-47.

For many commentators, the solution was to rely more on attack submarines to conduct the forward battle and to proliferate TLAM capability across the fleet to reduce reliance on the carriers for offensive capability. But here, too, critics saw risks of unintended escalation. Australian academic Desmond Ball worried that the dual-capable Tomahawk sea-launched cruise missile (SLCM) would blur the distinctions between conventional and nuclear conflict as well as between tactical and strategic nuclear use:

With regard to the firebreak between the tactical and strategic use of nuclear weapons, it is possible to envision a number of uses of the Tomahawk SLCM that could lead to miscalculations by the United States and misperceptions by the Soviet Union. For example, whereas the U.S. might regard the SLCM as a tactical weapon because of the nature of its deployment, the Soviet Union could well regard it as a strategic weapon because of its potential to destroy Soviet strategic installations. And with respect to the conventional/nuclear firebreak the Soviet Union must consider any vessel equipped with Tomahawks to be a nuclear threat even if in fact these missiles are carrying only conventional payloads. The obfuscation of these distinctions is likely to increase Soviet paranoia about U.S. naval deployments in the vicinity of the Soviet homeland; it inevitably reduces the degree of certainty with which Soviet responses can be predicted; it increases the likelihood of escalation from actions that the U.S. might regard as being tactical; and it increases the chances of miscalculation and misperception and hence of inadvertent escalation in general.

Thus, according to Ball, “a special case can be made against the deployment of the Tomahawk TLAM(N) SLCM on the general purpose ships.”¹²⁹

In addition to its neglect of escalation risk, the *Maritime Strategy* was also criticized for its central assumption – that a war at sea with the Soviet Union would remain non-nuclear. As a former U.S. Navy analyst explained in *Proceedings*:

¹²⁹ Ball, *op. cit.*, 14, 30.

For at least ten years, theater nuclear warfare analysts have largely agreed that the Soviets would use nuclear weapons against NATO ships at sea only after a nuclear first strike occurred ashore. This proposition is based partly on the U.S. perception that the Soviet Navy plays a subordinate role in the military hierarchy, and on the Soviet war plan.... This belief – that nuclear war at sea probably will not happen apart from nuclear use ashore – is an important assumption underlying the credibility of former Navy Secretary John Lehman’s maritime strategy.

Perhaps the Soviets will forgo using nuclear weapons against forward-deployed U.S. Navy forces – at least until they have shocked the world by launching nuclear ground weapons in NATO’s Central Region. But what if they do not? Have we consigned thinking about when and how the Soviets would employ nuclear weapons against the U.S. Navy to what Admiral James Stockdale called the “too-hard shelf”?¹³⁰

In an award-winning essay, Captain Brooks also acknowledged this pivotal assumption and re-examined the *Maritime Strategy* through a nuclear lens:

Several significant changes arise from the use of nuclear weapons. Since neither the nuclear decision nor its timing are likely to be under Navy control, we will immediately be thrust back into the second phase of the strategy – seeking to regain the initiative. Broad strategic goals will remain unchanged, but the strategy must immediately embrace a new goal of preventing further escalation, as well. Finally, it will be essential to seek truly rapid war termination. Further escalation to the strategic level threatens to destroy the United States. Continued theater nuclear conflict threatens to destroy our allies. Neither result can be tolerated. Consequently, rapid war termination without further escalation must become the overriding U.S. strategic objective once the nuclear threshold has been crossed.

¹³⁰ Hamlin A. Caldwell, Jr., “Nuclear War at Sea,” *Proceedings* 114, no. 2 (February 1988): 60-63.

The combination of the revised strategic objectives and the new warfighting conditions created by the introduction of nuclear weapons will influence all warfare areas. The obvious impacts include the following:

Antiair Warfare [AAW]...Current Navy nuclear AAW weapons will do little to offset the advantage the Soviets gain from nuclear antiship missiles. If restrictions on homeland strikes preclude attacking [Soviet] bomber bases, fleet air defense will pose an exceptionally demanding problem.... [This] places a premium on destruction of Soviet antiship platforms – during the conventional phase of the war, before escalation.

Strike Warfare...Assuming the [nuclear] destruction of air bases ashore, carrier battle groups may comprise a substantial fraction of surviving allied tactical air power. Therefore, the Navy may be required to project power – both nuclear and conventional – directly onto the Central Front. These considerations, coupled with the AAW problems, suggest that the carriers that survive the initial Soviet nuclear strikes should be pulled back, regrouped, and employed where their unique capabilities can make the best contribution to rapid war termination.

It might appear that crossing the nuclear threshold should require a radical change in the employment of TLAM/N-equipped ships. The inevitable pressures for such a change must be resisted, however. The fraction of the TLAM/N force that serves as a nuclear reserve will obviously not be employed during this period; weapons controlled by theater commanders may prove inferior to aircraft for strikes outside the Soviet homeland in support of the inherently fluid land battle. Thus, TLAM/N-equipped platforms may be best employed by continuing their normal missions. This is especially true for submarines because of the increased importance of [strategic] ASW in discouraging further escalation, once the nuclear threshold has been crossed.

Antisubmarine Warfare: With a premium placed on rapid war termination without escalation, U.S. ASW forces will need to expedite their campaign against Soviet SSBNs. Altering the nuclear balance by destroying such submarines is a chief source of war termination leverage. Other ASW missions should receive a lower priority.... The only apparent way to expedite the campaign will be to increase the number of submarines by sending essentially the entire attack submarine force into the forward areas and depending on P-3s and battle group assets for open-ocean ASW.

*Amphibious Warfare...*with the possible exception of small, covert raids, amphibious warfare will essentially have no role after nuclear escalation.¹³¹

At the same time, Brooks continued to voice support for the strategy itself:

...prudent military planners must consider unfavorable as well as favorable futures. Now that the *Maritime Strategy* is understood and accepted throughout the fleet we must build on that foundation and devise related strategies for other levels of warfare.

The strength of the *Maritime Strategy* is that it is not a Washington-imposed dogma. Instead, it is the professional consensus of the Navy's leadership. There is no similar consensus concerning naval nuclear warfare. The nuclear strategy postulated in this article is almost certainly wrong. Most firms' attempts are. Nevertheless, it represents an initial attempt to forge the required professional consensus on nuclear war at sea. Such a consensus can only arise from study and debate by Navy professionals both military and civilian. Before the *Maritime Strategy*, we could not have had such a debate, for we lacked the appropriate strategic framework. Now we have that framework. It is time to use it, and begin to face the strategic challenges of nuclear weapons.¹³²

¹³¹ Captain Linton F. Brooks, USN, "The Nuclear Maritime Strategy," *Proceedings* 113, no. 4 (April 1987): 33-39.

¹³² *Ibid.*

The same concerns were voiced by other U.S. naval experts.¹³³

The Navy ended the 1980s still struggling to reconcile the nuclear and conventional aspects of the *Maritime Strategy*. Taking up his own charge, Captain Brooks, along with Frank Miller, then the Director of Strategic Forces Policy in OSD, penned a *Proceedings* essay in August 1988 that postulated a very narrow deterrent role for the Navy's theater nuclear capability:

Our real leverage over Soviet nuclear decision making lies in the Soviet preoccupation with the land campaign. The U.S. ability to retaliate against targets ashore serves as a powerful deterrent to Soviet initiation of nuclear war at sea. The Secretary of Defense Annual Report for Fiscal Year 1984, for example, notes that "our sea based forces for land attack...support our policy that we will not permit the Soviets to limit a nuclear war to the sea." Similar statements appear in subsequent Annual Reports and in congressional testimony of various senior Defense Department spokesmen.

While this policy might well deter the Soviets from considering nuclear attacks on the fleet initial Soviet use at sea is unlikely in any event, given their emphasis on the land battle. Of far greater concern is the need to deter Soviet nuclear use at sea, if nuclear weapons already have been used ashore.

But if either side initiates the use of nuclear weapons ashore it is not certain any naval capability or policy can deter the spread of the nuclear conflict to the sea. The threat of use against targets ashore is highly credible only if nuclear weapons have not been used in the land battle. If that use has already occurred, the only remaining linkage is the threat of widening the war through attacks on the infrastructure supporting the nuclear war at sea – especially operating bases for the most dangerous platforms, nuclear-armed Soviet Naval Aviation Badger and Backfir bombers. While striking such bases is militarily effective, it entails making high-risk, direct attacks on the Soviet homeland. While our declared

¹³³ See, for example, Normal Polmar, "The Soviet Navy: Nuclear War at Sea," *Proceedings* 112, no. 7 (July 1986): 111-113.

policy makes it clear that we are willing to accept these risks, the Soviets may conclude otherwise. If so, they will not be deterred.

Therefore, the deterrent role of naval nuclear capabilities in and of themselves is limited. The Navy is not directly relevant to the Soviet decision to use nuclear weapons ashore and is limited in its ability to deter Soviet use at sea once they have been used ashore. Only in the unlikely contingency of Soviet first use at sea is there a unique naval deterrent capability.¹³⁴

Rather, the main contribution of naval theater nuclear forces would come in the event deterrence failed and the Soviets started using nuclear weapons at sea:

...Since other naval weapons will probably not, in themselves, deter the spread of nuclear war to the sea once it has begun ashore, acquisition judgments for U.S. sea-based nuclear weapons must be based not only on deterrence, but also on their military contribution should deterrence fail.

Such considerations suggest that...nuclear anti-air warfare weapons are almost certainly required to counter the unique threat that Soviet nuclear-armed anti-ship cruise missiles pose. The current lack of any program for acquiring such weapons is dangerous.

The relatively limited role of surface forces in Soviet naval strategy and the comparative vulnerability of most Soviet surface ships to conventional attack make the need for nuclear anti-ship weapons less obvious. Finally, the judgment of what nuclear ASW capability to procure rests on an assessment of U.S. conventional ASW capability. Ideally, we would require no nuclear ASW weapons; but practically, given the immense importance of the Soviet submarine force, such weapons may provide an essential

¹³⁴ Captain Linton F. Brooks, USN, and Franklin C. Miller, "Nuclear Weapons at Sea," *Proceedings* 114, no. 8 (August 1988): 41-45.

hedge against catastrophically poor performance of U.S. ASW torpedoes in the future. Failure of conventional torpedoes in wartime is not unknown in U.S. naval history.

It may seem inconsistent to argue simultaneously that sea-based weapons (except land-attack weapons) cannot ensure deterrence but that they should be acquired nevertheless. It is not. Deterrence, while the primary reason for acquiring all weapons, nuclear or not, cannot be our goal. The Navy needs a strong nuclear capability to influence the initial decision to go to war and to enhance our capability should deterrence fail.¹³⁵

While the authors could not foresee the collapse of the Soviet Union and the denuclearization of the U.S. Navy's general purpose forces three years later, their advice would resonate today amid concerns of Russian interest in limited nuclear use to terminate a conventional conflict on terms favorable to Moscow.¹³⁶

[Should nuclear use at sea occur] The most fundamental Navy requirement is to continue to operate and fight. This demands training and tactics tailored for a nuclear environment. It also requires improved ship and aircraft survivability. No sane person believes a ship can survive a direct hit from a nuclear weapon, nor is that being suggested here. But the immense destructiveness of nuclear weapons and the wide-ranging nature of their effects raise possibilities of multiple kills from the same weapon, of ships destroyed by near misses, and of weapon systems rendered useless over ranges of hundreds of miles. It is these radical consequences that Navy hardening and survivability programs must prevent. *Such programs and the accompanying training and tactics will be required as long as Soviet nuclear weapons exist, even if there are no U.S. Navy nuclear weapons.*¹³⁷

¹³⁵ Ibid.

¹³⁶ Office of the Secretary of Defense, *Nuclear Posture Review*, February 2018, XI-XII, 7.

¹³⁷ Brooks and Miller, *op. cit.* Emphasis added.

With the rapid demise of Communism in Eastern Europe, President George H. W. Bush moved quickly to scale back the vast U.S. theater nuclear force posture, announcing deep unilateral cuts in the Presidential Nuclear Initiative of September 1991. For the Navy, this meant:

All nuclear weapons would be removed from surface ships, attack submarines, and land-based naval aircraft. Those included: 100 nuclear TLAM-N that were routinely deployed; Mark 57 and Mark 61 naval nuclear bombs; and nuclear depth bombs associated with land-based nuclear naval P-3 aircraft and carrier-based S-3 aircraft. All in this latter category – approximately half of the total naval tactical nuclear stockpile – would be destroyed. The remainder, including all TLAM-N, would be put in storage. The Department of Defense put notable public emphasis on the intention to retain the ability to redeploy TLAM-N – considered an important element of the U.S. nuclear umbrella for Asian allies.¹³⁸

In essence, the White House used the rapidly improving security environment to address a number of tactical nuclear weapon conundrums. In the Navy's case, removing all nuclear weapons from general purpose forces would solve the growing problem of countries denying access to nuclear-armed U.S. warships. New Zealand, in particular, sparked a major crisis in bilateral relations in 1985 when it denied the destroyer *USS Buchanan* permission to dock in Auckland for refusing to confirm or deny the presence of nuclear weapons aboard.¹³⁹ De-nuclearizing the general purpose forces would also break the service's nuclear ambivalence:

Many senior Navy officer hoped for an end to all naval nuclear weapons except for [SLBMs]. One key [PNI] participant has argued that the Navy saw nuclear weapons on surface ships as

¹³⁸ Susan J. Koch, "The Presidential Nuclear Initiatives of 1991-1992," *Case Study Series No. 5*, Center for the Study of Weapons of Mass Destruction, National Defense University, September 2012, 11.

¹³⁹ For background and implications for the U.S. Navy, see Henry Cronin, "New Zealand's Anti-Nuclear Legislation and the United States in 1985," *Sources and Methods*, The Wilson Center, August 26, 2020, <https://www.wilsoncenter.org/blog-post/new-zealands-anti-nuclear-legislation-and-united-states-1985>.

an obstacle to its freedom of movement, a barrier to their being – and being seen as – globally dominant. The presence of nuclear weapons on board complicated and constrained port visits, and entailed procedural requirements that commanders viewed as onerous and out of proportion to the weapons’ value.¹⁴⁰

The Navy swiftly implemented the PNI, withdrawing an estimated 500 nuclear weapons from aircraft carriers, surface ships, and attack submarines by June 1992.¹⁴¹ At the behest of OSD, the Navy maintained the TLAM-N in storage within the United States until they were retired by the Obama Administration in 2013.

Assessing the Navy’s Cold War Approach to Nuclear-Conventional Synchronization

Across these four phases spanning the 1940s to early 1990s, what did the Navy manage to accomplish in terms of nuclear and conventional synchronization? What gaps remained as the Cold War ended?



Figure 9: Radioactive hulk of aircraft carrier USS Independence following atomic blast during Operation CROSSROADS in 1946. Photo credit: U.S. National Archives.

Nuclear-Conventional Synchronization Accomplishments

For the post-World War II Navy, atomic weapons were both menacing and coveted. They threatened to make surface fleet obsolete, yet they were the new crown jewels in the U.S. arsenal and poised to become an Air Force

¹⁴⁰ Ibid., 5-6.

¹⁴¹ William M. Arkin and Robert S. Norris, *Taking Stock: U.S. Nuclear Deployments at the End of the Cold War*, Greenpeace/NRDC, August 1992 (Revision 1), 4.

monopoly. Confronted with this situation, the Navy went on the offensive; it simply denied that surface flotilla were outmoded, going so far as to orchestrate two atomic test blasts in 1946 to make its case. Despite horrific damage to the two aircraft carriers and other vessels in the tests (see Figure 9), the Navy asserted that simple modification of procedures could diminish the risk of losing multiple ships to a single atomic explosion. A group of Navy leaders then sought to challenge the Air Force head-on for the strategic bombing mission, but the so-called “Revolt of the Admirals” failed. Afterwards, the Navy recalibrated its approach, instead making the case for a distinctive nuclear mission – more discriminate atomic bombing of tactical-operational targets. These were largely targets of maritime interest – naval bases, ports, submarine pens – but the Navy strengthened its hand by arguing that it also needed atomic bombs to support U.S. ground troops in Europe. The Navy succeeded in gaining access to atomic weapons by 1950 but this was a bureaucratic accomplishment, not one of strategy.

Unlike the Air Force,¹⁴² the Navy looked to nuclear weapons to supplement rather than supplant conventional weapons. This distinction was driven by the Navy’s historical predilection for flexibility, interest in downplaying and then deterring the risks of nuclear combat at sea, and lack of a strategic bombing culture. The Navy’s approach to synchronization essentially was to embrace dual-capability in the 1960s, giving a wide variety of platforms the ability to employ either nuclear or conventional gravity and depth bombs, torpedoes, and SAMs.¹⁴³ Thus equipped, the Navy could provide nuclear fires across the spectrum of strategic, theater, and tactical combat. In service of its cherished flexibility, the Navy refused to let the presence of nuclear weapons aboard its general purpose vessels – about a third of the fleet was certified to carry such weapons in the mid-1980s – constrain their deployment for conventional missions, however. The overarching U.S. policy neither to confirm nor deny the presence of nuclear weapons was useful in this regard.

¹⁴² See Chapter Three, 186-188.

¹⁴³ Again, the SSBN stands out as a purpose-built force dedicated to strategic nuclear deterrence.

At the same time, the Navy recognized the politically sensitive nature of nuclear weapons and implemented special security and handling procedures over them, thereby imposing considerable financial and technical burdens on the service and its commanders. In making the rapid switch to dual capability, the Navy demonstrated logistical and procedural proficiency.

The Navy accompanied the nuclearization of its general purpose forces with a rigorous training regime. Nuclear weapons employment criteria and defensive techniques were in the hands of almost every unit commander in the mid-1960s. Commanders were routinely rated for nuclear weapons security and handling. Aircraft carriers regularly exercised nuclear strikes and were held in high states of nuclear readiness during this time, satisfying SACEUR and national plans and policy. These were significant accomplishments in training and operational preparedness, though not without risk.¹⁴⁴ The extent to which Polaris SSBNs freed up carrier-based and/or land-based airpower for non-nuclear missions is an important but under-studied aspect of Cold War nuclear-conventional synchronization.

After the relative atomic ambivalence of the 1970s, the Navy re-prioritized naval nuclear warfare in the late-1970s and 1980s. This strategic renaissance stemmed largely from the rapid growth and nuclearization of the Soviet Navy, which brought into focus the U.S. Navy's vulnerability. Deterring Soviet nuclear use at sea became increasingly important due to concerns it might be a less escalatory and therefore more attractive option to Moscow than using nuclear weapons in central Europe. A retired USN P-3 pilot and strategic planner writing in July 2023 offered a view on what this renaissance achieved and how:

By deploying tactical nuclear weapons throughout the fleet the Navy was transformed into an overwhelming peripheral threat from the sea against Soviet targets ashore. The surface force,

¹⁴⁴ During the Cold War, the Navy experienced two nuclear weapons accidents and hundreds of incidents involving damage to a nuclear weapon component or equipment. See *Narrative Summaries of Accidents Involving U.S. Nuclear Weapons 1950-1980*, Department of Defense, 1981, 7, 9-10, Available at: <https://www.hsdl.org/c/view?docid=26994>. See also Richard Halloran, "Navy Cites 2 Accidents with Nuclear Arms," *New York Times*, January 16, 1986, <https://www.nytimes.com/1986/01/16/us/navy-cites-2-accidents-with-nuclear-arms.html>.

tactical aviation, and attack submarines became a potent tactical nuclear attack force operating on numerous axes.

Navy surface combatants became part of the operational and deterrent solution, not part of the force to be protected by fleet air wings and submarines. The outcome was a drastic nuclear warfighting complication for Soviet defenses against Navy cruise missiles and aircraft. The effect on deterrence and escalation control of the Navy's ability to project tactical nuclear firepower ashore was remarkable.

Likewise, tactical nuclear war at sea became much more evenhanded. Striking power against the Soviet surface fleet was greatly increased, and the development of nuclear antisubmarine weapons (antisubmarine rockets and depth charges) virtually ensured a platform kill against increasingly advanced Soviet submarines. This integration of tactical nuclear weapons presented an intractable problem for the Soviets.¹⁴⁵

Driven by the CNO's concerns, the Navy got serious about setting and implementing nuclear hardening requirements in the 1980s. It issued an all-hands theater nuclear warfare training plan and developed new computer simulation tools. All this to enhance the credibility of deterrence and ready the fleet for nuclear combat at sea in the event deterrence failed.

Aided by outside experts, the Navy changed its long-held view about Soviet naval priorities, demonstrating an institutional ability to learn and adapt. In so doing, the Navy came to see how the Soviet Navy foremost intended to use its general purpose forces to defend its SSBNs, Moscow's strategic nuclear reserves. Without calling it such, the Navy set about attacking this Soviet strategy of nuclear-conventional synchronization with nuclear-conventional synchronization of its own – a conventional ASW campaign against Soviet SSBNs combined with an implied threat of carrier-launched nuclear strikes against the USSR to tie down Soviet

¹⁴⁵ Giarra, *op. cit.*

airpower, preventing it from fully supporting the land campaign. The Navy's intent was to demonstrate that its general purpose forces could manipulate the Soviet decision calculus – to make nuclear escalation and war termination bargaining seem less attractive, thereby helping to deter the outbreak of war. In this synchronized manner, the Navy hoped to make a major contribution to national and alliance security, but its *Maritime Strategy* carried escalation risk of its own (see below).

In a 1987 *Proceedings* article Commander James John Tritten showed a keen understanding of nuclear and non-nuclear synchronization that remains relevant today and merits quoting at length:

*Recommended Read: Tritten's
“(Non)Nuclear Warfare,”
Proceedings, February, 1987.*

In addition to considering the unique problems of maritime nuclear war, navies need to examine thoroughly

the relationship of nonnuclear warfare to nuclear operations and deterrence. Failure to understand these relationships might lead to planning for nuclear and conventional operations with totally separate staffs and differing approaches, resulting in incongruous war plans and tactics.

Many Western critics of prospective offensive operations against [Soviet SSBNs] believe that conventional war-fighting against strategic forces at sea threatens the deterrence of nuclear war. However, despite what Western critics think, such a policy is the Soviet Union's actual declaratory policy. The Soviets apparently recognize some sound military reasoning for attacking Western SSBNs (damage limitation, prevention of reuse, and to restrain nuclear use by the West).

Nonnuclear military forces can be used to degrade the employment of enemy nuclear weapons. For example, conventional ballistic missile defenses (BMD) can reduce the impact of an incoming nuclear strike.... Unconventional nonnuclear military actions can also be taken to degrade rather than destroy enemy nuclear forces.

The actions might frustrate intelligence gathering or retargeting efforts enough to make effective nuclear use impossible. The outcome of war in space, for example, might be crucial.

Conventional forces can also be used to enhance the employment of our own nuclear forces. Conventional attacks on intelligence and warning sites might aid bombers and cruise missiles in their attempt to penetrate defenses. The Soviets appear to use conventional defenses to ensure the survivability of some of their SSBNs. This defense allows conventional Soviet naval forces simultaneously to ensure their SSBNs' combat stability and also to defend the sea approaches from cruise missiles, shorter range ballistic missile carriers, and other naval forces, along with bombers. Conversely, nuclear weapons can enhance the employment of our own conventional forces (e.g., nuclear weapons can be used to open up channels for conventional force break-through).

As we become more sophisticated in our recognition of how nuclear and nonnuclear operations affect each other, we need to expand our analysis accordingly. For example, the attrition of dual-capable naval, air, and ground forces during the initial conventional phase of a war will probably have a great impact on the availability of forces to fight if the war were to become nuclear. As air-breathing systems proliferate and navies assume more of a role in continental air defense, planners will require a more integrated picture of the war. Dynamic assessments must be provided to inform the decision makers exactly how many of what type of offensive and defensive forces are available for combat at the varying stages of a war.

During a war, we should expect nonnuclear forces to be used to degrade or enhance the employment of nuclear weapons. We should also plan for the possibility that nuclear weapons will be used against conventional forces and vice versa.

We can draw [some] inferences from this discussion:

- In preparation of threat and net assessments, tabulations of offensive nuclear forces are simply not enough. Serious analyses must include dynamic measures and the interrelationship of nuclear and nonnuclear forces, and must include time as a variable.
- Warfare must not be split into two general categories with a separate role for nuclear forces. If this were to happen, conventionally oriented experts might not consider the impact of their operations on the continued deterrence of nuclear war. Similarly, nuclear war experts might not be involved with the overall formation of the politico-military objectives, and fail to achieve a satisfactory war termination.

Nuclear war must be taken seriously if nations desire to deter nuclear war while they are engaged in conventional conflict. Nuclear operations are neither the end of war nor the end of politics. Nonnuclear operations taken in the initial conventional phase of a war may make enough strategic difference to enhance the deterrence of nuclear war. Such operations need to be contemplated, for both short and long wars.

In order to avoid a split into general and nuclear warfare, the West will need to preclude the semantic infiltration of arms control terms into strategic thought and staff bureaucracy. The Soviet Union does not limit the term “strategic” to describe military weapons or operations that involve only intercontinental exchanges.

- Wargaming and crisis simulation will increase in complexity as games are forced to deal with nuclear and nonnuclear issues simultaneously. Games and simulations can be used to explore deterrence of nuclear war during a conventional phase. Games can assist in a much-needed examination of the impact of varying correlations of forces on the use of conventional forces for peacetime political gain. Wargames

need to continue through the initial use of nuclear weapons. Above all, gaming should not terminate late on Friday afternoon with a spasm nuclear exchange.

- Finally, war termination should be thought through and the politico-military objectives of warfare identified. Nuclear war is undesirable but cannot be ignored by the professional. War planners need to identify the results that will make the postwar era more palatable, intra-war nuclear escalation unlikely, and negotiating peace easier. Perhaps the best view is that in today's environment, all wars between superpowers are nuclear; but in some, the nuclear weapons have not yet been used.¹⁴⁶

These precepts ring true today, nearly four decades later.

Remaining Gaps in Nuclear-Conventional Synchronization

While the Navy made important strides in the synchronization of nuclear and conventional weaponry during the Cold War, some major gaps remained. Foremost among these was a service doctrine for how to wage nuclear combat at sea; that is, how to transition rapidly from a conventional to a nuclear posture, how conventional and nuclear operations could support each other, and how to prevail in mixed nuclear and conventional combat at the theater level. This doctrinal gap was lamented by Navy officer and other experts from the 1960s through the 1980s. Instead, what existed was a 1950s "philosophy" indicating the Navy's intent to use nuclear weapons more discriminately than the Air Force, procedural manuals on how to employ nuclear weapons physically, and a widely held, self-serving assumption that the Soviets would keep naval warfare non-nuclear. The 1980s *Maritime Strategy* itself was conceptual, not service doctrine *per se*. It lay outside the formal structure of U.S. military strategy, which is developed by the President, the Secretary of Defense, the Joint Chiefs and the Unified Commanders. As the CNO did not have responsibility for

¹⁴⁶ Commander James John Tritten, USN, "(Non)Nuclear Warfare," *Proceedings* 113, no. 2 (February 1987): 64-70.

strategy development even within the Navy, the legitimacy of his *Maritime Strategy* was questioned by fleet commanders¹⁴⁷

The reasons for this doctrinal gap were numerous. The Navy lacked a tradition of written doctrine. It also was beset by parochialism – aviators and surface- and sub-surface warriors who evaluated threats and responses differently. The technical issues involved were complex and the impact of tactical nuclear use on naval combat was uncertain. Many of the details, including what the United States learned of Soviet naval doctrine, were highly classified and compartmented, which impeded the building of service-wide awareness. JCS planning during the Cuban Missile Crisis likely impressed upon the Navy the limited utility of U.S. tactical nuclear weapons compared to conventional weapons. Above all was the sense that aircraft carriers, the Navy's centerpiece, could not survive nuclear attack and hardening of the fleet therefore was a fool's errand.

The other major gap in Navy nuclear-conventional synchronization during the Cold War was inadequate consideration of escalation risks and how best to manage them. This was one of the principal critiques of the *Maritime Strategy*. Some Navy thought leaders acknowledged this shortcoming, others dismissed the risk of escalation, calling it “the rhetorical fallacy of the uninformed.”¹⁴⁸ Looking back, former Vice-CNO Admiral William Small indicated that the Navy was intentionally vague as to how far it would carry the strategy in order to maximize Soviet restraint—that is, “It was simply an option that needed to be considered at an appropriate time.”¹⁴⁹

The more it devoted attention to Soviet naval doctrine in the 1980s, however, the less confident the Navy was in its ability to deter nuclear combat at sea.¹⁵⁰ To compensate, Defense Secretary Caspar Weinberger

¹⁴⁷ Hattendorf, *op. cit.*, 85-86.

¹⁴⁸ Lieutenant Commander Michael N. Pocalyko, USN, “Sinking Soviet SSBNs,” *Proceedings* 113, no. 10 (October 1987).

¹⁴⁹ Christopher A. Ford and David A. Rosenberg, “The Naval Intelligence Underpinnings of Reagan's Maritime Strategy,” *The Journal of Strategic Studies* 28, no. 2 (April 2005): 396.

¹⁵⁰ Arkin, *op. cit.*, 7.

warned in 1983 that "It will be U.S. policy that a nuclear war beginning with Soviet nuclear attacks at sea will not necessarily remain limited to the sea." Captain Brooks pointed out, however, that this threat to retaliate against the Soviet homeland had very limited applicability and, therefore, credibility. As Desmond Ball saw it in 1985:

Despite the fact that escalation control has been the predominant concept in U.S. national strategic policy for more than a decade now, the U.S. Navy has still to regard the concept seriously.

There are several reasons for the Navy's resistance. First, and most generally, the U.S. Navy is much more self-contained than the other services, and its autonomy is cherished as a primary value. Naval planners do not give much thought to the operational concepts and plans of the other services and do not see why outside influence should be directed at their concepts and plans. Second, naval officer generally accept a traditional, uncompromising view of their mission in the event of conflict to "seek out and destroy" the opposing naval forces, by the most effective means possible. Third, naval officer generally do not believe that escalation control is a serious proposition anyway, and hence to sacrifice operational effectiveness in its pursuit is extremely foolish.¹⁵¹

The Navy also came up short on operational aspects of nuclear-conventional synchronization. For instance, it is not clear that it ever had a realistic plan to use nuclear-armed SAMs. OP-65 director Rear Admiral Holland explained the challenge to Congress in 1984: "When you see an incoming flight of aircraft or missiles, how do you know it is nuclear? How do you know if you should use nuclear weapons? When should you? Under what circumstances?"¹⁵² Further complicating matters was that use of nuclear-armed SAMs would require presidential authority. Unless such release authority had been pre-delegated, it was highly unlikely that it

¹⁵¹ Ball, *op. cit.*, 28.

¹⁵² Walter Pincus, "Nuclear Missile Has Navy in a Quandary," *Washington Post*, January 14, 1984.

could be requested and granted during a tactical engagement.¹⁵³ “Asked if the Navy had taken presidential approval for use of nuclear weapons into account in its battle plans, Holland said, ‘I don’t think it is realistic, but it is factored in.... We have not come to grips with that part of the problem. We keep trying.’”¹⁵⁴

While the Navy had remedial efforts underway to harden general purpose forces against nuclear weapons effects, major gaps remained in the 1980s. In 1982, one Navy thought leader observed, “...our ships and aircraft are not built with the possibility of nuclear war in mind. Aluminum superstructures and sophisticated solid-state electronics offer minimal protection and reliability in a nuclear environment.”¹⁵⁵ Another Navy office noted in 1985 that, “the U.S. Navy has done little in this area. Consequently, U.S. naval forces are less survivable in the [maritime nuclear warfare] environment than Soviet forces.”¹⁵⁶ Long considered “non-productive,” hardening of U.S. Navy general purpose forces relaxed considerably in the early 1990s.¹⁵⁷

A similar situation prevailed in the area of training. As one Navy office remarked in 1982, “Possibly because we don’t have a functional doctrine, we do not conduct adequate training for the employment of tactical nuclear weapons.... [D]uring refresher training or while conducting an operational readiness evaluation, we conduct nuclear, biological, and chemical [defensive] training. However, training for offensive tactical employment is conspicuously not performed.”¹⁵⁸ This neglect of nuclear weapon employment training was in marked contrast to that of the 1950s

¹⁵³ The Navy was not alone in this predicament, as the U.S. Army operated nuclear-capable Nike-Hercules SAMs in Western Europe, for example.

¹⁵⁴ Pincus, *op. cit.*

¹⁵⁵ Parker, *op. cit.*, 11.

¹⁵⁶ Thomas, *op. cit.*, 48.

¹⁵⁷ Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics, *Report of the Defense Science Task Force on Nuclear Weapons Effects, Test, Evaluation, and Simulation*, April 2005, 20. Unclassified

¹⁵⁸ Parker, *op. cit.*, 11.

but was not unique to the Navy. Already reluctant to promulgate a theater nuclear doctrine, skepticism that presidential authority to use nuclear weapons would be granted in the age of Flexible Response would have given the Navy little incentive to practice tactical nuclear weapons employment.

On balance, it can be said that while the Navy equipped its general purpose forces with both nuclear and conventional weapons throughout the Cold War, this was not a truly integrated capability but rather a technical short-cut to a strategy conundrum.¹⁵⁹ By all public accounts, including the CNO's 1978 report, had the Cold War turned hot and the Soviet Union initiated naval nuclear combat, the U.S. Navy would have found itself greatly – perhaps fatally – disadvantaged. What the Navy saved by not investing the necessary intellectual and financial capital in a workable doctrine for naval nuclear combat and a force hardened to prevail in it, was offset by the enormous military risk it was taking.

¹⁵⁹ Douglass and Hoeber, *op. cit.*

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CHAPTER THREE: The U.S. Air Force's Approach to the Synchronization of Nuclear and Conventional Weapons During the Cold War

During the Cold War, what did the synchronization of nuclear and conventional weapons mean for the U.S. Air Force in terms of motivation, organization, doctrine, force posture, and training? The answers vary over time. Three phases of nuclear-conventional synchronization, with some degree of overlap, can be identified

1. Drive for nuclear exclusivity (mid 1940s-mid 1960s)
2. Nuclear hangover (mid 1960s-early 1970s)
3. Theater nuclear malaise (1970s-early 1990s)

Across these phases, what did the Air Force manage to accomplish in terms of nuclear and conventional synchronization? What gaps remained as the Cold War ended?

1. Drive for Nuclear Exclusivity (Mid 1940s-Mid 1960s)

In this first phase of nuclear and conventional synchronization, airpower theory, and in particular strategic bombing against the enemy's urban-industrial base, dominated Air Force thinking and priorities.¹ The phase covers the first tentative steps to adopt atomic weapons, through the rise of the air-atomic offensive, and the push to rid the Air Force of conventional arms and rely solely on nuclear weapons. It ends roughly with the eclipse of the manned strategic bomber by the intercontinental ballistic missile (ICBM), the shift to Flexible Response, and the retirement of General Curtis LeMay.

¹ The Italian airpower theorist Giulio Douhet was influential in shaping pre-atomic U.S. Army Air Force strategy and concepts. See his *Command of the Air* (Maxwell Air Force Base, Alabama: Air University Press, 2019), translated by Dino Ferrari, https://www.airuniversity.af.edu/Portals/10/AUPress/Books/B_0160_DOUHET_THE_COMMAND_OF_THE_AIR.PDF.

The Army Air Forces (AAF) were responsible for dropping the first atomic bombs on Hiroshima and Nagasaki, putting them at the forefront of the synchronization of conventional and nuclear weapons. They were accorded this role by technological happenstance – they possessed the only bomber large enough to carry the first atomic weapons, which weighed some 10,000 pounds each – and operational convenience, as they were already conducting a strategic bombing campaign against Japan. Indeed, the AAF's bombing of Tokyo on 10 March 1945, which used a combination of high explosives and napalm, killed an estimated 100,000 civilians, more than either of the atomic bombs.²

AAF leaders understood the significance of the strategic bomber offensive they had honed during the war and what it portended. Writing in May 1945 to Army Chief of Staff General George Marshall on future warfare, AAF Commander General Henry “Hap” Arnold observed:

It is clear that the only defense against such warfare is the ability to attack. We must, therefore, secure our nation by developing and maintaining those weapons, forces, and techniques required to pose a warning to aggressors in order to deter them from launching a modern devastating war.

As a leading historian of the period noted, “To the Air Force, the national security demanded that it have the most modern aerial weapons to deter an attack or else repel it and then launch a retaliatory counterstrike. Thus, even before the dropping of the atomic bombs and the end of the war, the Air Force had linked national security, technological development, and deterrence of attack.”³

Convinced that strategic bombing had caused the defeat of Germany and Japan, AAF leaders moved quickly to assess the impact of the atomic

² Malcolm Gladwell, *The Bomber Mafia* (New York: Little, Brown and Company, 2021), 185. See also Brad Lendon and Emiko Jozuka, “History’s Deadliest Air Raid Happened in Tokyo in World War II and You’ve Probably Never Heard of It,” *CNN*, March 8, 2020.

³ John T. Greenwood, “The Emergence of the Postwar Strategic Air Force, 1945-1953,” in Alfred F. Hurley and Robert C. Ehrhart, eds., *Airpower and Warfare: Proceedings of the 8th Military History Symposium, United States Air Force Academy, 18-20 October 1978* (Washington, DC: Office of Air Force History, Headquarters, USAF and United States Air Force Academy, 1979), 219. Emphasis in the original.

bomb. The Spaatz Board reported to Arnold in October 1945 that the strategic air offensive concept remained valid and that no changes to AAF size, composition, organization or deployment were necessary. Atomic bombs simply were another, albeit tremendously powerful, weapon to be employed in a strategic air offensive. The board called for a strong atomic bomb research and development effort and recommended that then-Major General Curtis LeMay, architect of the wartime strategic air offensive, lead it.⁴ In early 1947, LeMay shared with the Military Liaison Committee to the Atomic Energy Commission a memo summarizing AAF thinking about atomic weapons:

Success in a war of the future will depend more than ever before on the industrial capacity and efficiency of the protagonists, therefore, destruction of the enemy's industrial capability will contribute most toward reduction of his ability to wage war. This fact coupled with the character of the atomic explosion leads to the conclusion that the most profitable target for the atomic bomb will be large industrial centers.

...more important than defensive measures is the prevention of the initial attack. Fear of retaliation has always been the greatest deterrent to any nation contemplating all-out war. Twice in this century our unpreparedness has led a would be world conqueror to believe he could achieve such success. Japan was well aware of our weakness when she struck at Pearl Harbor. The ability to strike back effectively will be our best guard against attack.... The possession of a substantial number of atomic weapons and the means of delivering them to any part of the world provides the most potent threat of retaliation known to man.⁵

This thinking was codified in 1948 when the Air Force issued a then-Top Secret *Doctrine of Atomic Air Warfare*. The doctrine saw atomic weapons as simply the next step in an historical pattern of ever-increasing firepower and called for the delivery of the "maximum number of [atomic] bombs

⁴ Ibid.

⁵ Ibid., 223.

in the shortest possible time.”⁶ Notably, the atomic air warfare doctrine preceded publication of the Air Force’s first basic doctrine by six years

Compared to the Army and Navy, the Air Force was uniquely suited, in terms of doctrine and force structure, to integrate nuclear weapons into its conventional force posture, and had the easiest time of it.

In contrast to the Navy,⁷ the Air Force had the benefit of an agreed concept that not only accommodated the atomic bomb readily but was further validated by it. Nonetheless, the atomic bomb also raised problems for the AAF early on:

Two of the most critical were the dearth of reliable technical data for planning and the assimilation of the weapon within the existing air doctrine and organization without disrupting the basic structure. The Air Force at first embraced the atomic bomb cautiously, even uncertainly, because it lacked sufficient knowledge of the weapon and its production rates to gauge its strategic value or logistical requirements. Due to its current and projected tactical and technical limitations, Air Force leaders did not view the atomic bomb as a panacea for all wartime contingencies and were reticent to scuttle their combat-tested organization and doctrine.⁸

In this regard, the Manhattan Project “zealously guarded the technical details of the bomb and its production. Even the fact that the AAF was the only organization capable of delivering atomic bombs made little difference.”⁹

⁶ Fred Kaplan, *The Wizards of Armageddon* (New York: Simon and Schuster, 1983), 181-182. See also Robert J. Art, “The United States: Nuclear Weapons and Grand Strategy,” in Regina Cowen Karp, ed., *Security with Nuclear Weapons? Different Perspectives on National Security* (Oxford, UK: Oxford University Press, 1991), 64, n. 16.

⁷ See Chapter Two, 99-100.

⁸ Greenwood, *op. cit.*, 219-220.

⁹ *Ibid.*, 219.

Atomic enthusiasts within the AAF pressed for the creation of an atomic bombing “force in being,” based on the unit that had dropped the atomic bombs on Japan, the 509th Composite Bomb Group, the only operational atomic unit at the time. They were cautioned, however, by Lieutenant General Ira Eaker, AAF Deputy Commander:

It seems to me we are very likely to find the attitude of the War Department and of Congress to be that the atomic bombing force is the only strategic air force we will require. If one wing will do the job then one wing will be the size of the strategic air force.¹⁰

Eaker’s advice was to save the strategic bombing force from budget cuts by making the whole of it atomic. This bureaucratic stratagem, which was accepted by AAF leadership, had unforeseen consequences for nuclear and conventional synchronization. Particularly once fissile material became more plentiful, it further encouraged Strategic Air Command (SAC), established in March 1946, to focus exclusively on nuclear weapons.

In the meantime, the AAF struggled to operationalize an atomic bomber force:

The lack of data on the atomic bomb represented a major obstacle to the combat development of the postwar strategic air force. Clearance and access restrictions limited training of bomb commanders, weaponeers, assembly teams, flight crews, and staffs. Few air officers had more than a rudimentary knowledge of atomic energy and the peculiar requirements and characteristics of the bomb. The lack of technical information and knowledgeable personnel hampered research and development, prevented realistic strategic air war planning, and stifled the healthy evolution of tactics.

A small but major breakthrough for Air Force atomic operational readiness and planning came in the training and operations of the 509th Bomb Group during the CROSSROADS atomic tests at Bikini Atoll in June-July 1946. The group’s assignment to drop

¹⁰ Ibid., 220-221.

the ABLE Day test bomb on 1 July provided a wealth of detailed information.... The [Joint Chiefs of Staff] JCS Evaluation Board that met to report on the tests provided another opportunity for the AAF to learn more about the weapons that it alone could use.¹¹



Figure 10: SAC B-29 en route to drop an atomic bomb on naval flotilla as embled in the Bikini Atoll, July 1946. Photo credit: U.S. National Archives.

In the fall, the AAF was directed by the War Department to draw up plans for immediate initiation of a strategic bombing campaign against the Soviet Union:

When MAKEFAST was presented to Carl Spaatz and other Air Force leaders during the December 1946 commanders' conference, he directed that an atomic (special weapons) annex be developed and the plan revised quarterly using the latest information.¹²

¹¹ Ibid., 221-222.

¹² Ibid., 228. Major General LeMay was responsible for producing the annex. See David Alan Rosenberg, "U.S. Nuclear Stockpile, 1945 to 1950," *Bulletin of the Atomic Scientists*, May 1982, 28.

With only nine atomic weapons in the national stockpile¹³ and rapid post-war demobilization drastically reducing AAF size, “The Air Force was far short of its goal of an all-atomic strategic air arm to carry out its doctrines of atomic warfare and would have had serious trouble conducting even conventional operations.”¹⁴

By laying claim to the strategic nuclear mission, the Air Force was eager to set aside its supporting role to the Army and Navy and thereby protect its cherished autonomy. This was a victory for parochialism, however, not joint warfare.

A confluence of events in the late 1940s-early 1950s fostered aspirations of nuclear exclusivity in the Air Force, in terms of monopolizing the strategic nuclear mission among the armed forces, making it the centerpiece of

American defense planning, and even foregoing conventional weapons altogether as a service. In 1947, the AAF became the United States Air Force (USAF), an independent service, co-equal to the Army and Navy, and against which it would have to compete for funding. At its 1948 commanders’ conference, the USAF accorded its top priority to SAC and the strategic bombing mission.¹⁵ This was a unique military mission, one that philosophically and operationally would free the Air Force from its supporting role to the surface forces and ensure its autonomy.¹⁶ It also aligned with the nuclear imperative seized upon by the service’s top leadership, which itself was dominated by bomber enthusiasts. In this connection, LeMay was given command of SAC in 1948, bringing with him a sole focus on nuclear weapons. Reflecting on this pivotal period, LeMay noted:

¹³ Richard H. Kohn and Joseph P. Harahan, eds., *Strategic Air Warfare: An Interview with Generals Curtis E. LeMay, Leon W. Johnson, David A. Burchinal, and Jack J. Catton* (Washington, DC: United States Air Force, 1988), 95, n. 106.

¹⁴ Greenwood, *op. cit.*, 228.

¹⁵ *Ibid.*, 236.

¹⁶ *Ibid.*, 218-219.

...there wasn't any doubt in my mind that if we had to go to a full-scale war we would use nuclear weapons. That was the capability we worked on, to go to nuclear weapons. We didn't consider any [SAC] unit really combat ready unless it had a nuclear capability.... We were planning on a nuclear war.¹⁷

The Air Force was keen to protect its newfound strategic nuclear mission from encroachment by the Navy. At the 1948 Key West conference, the Air Force fought to keep the Navy from developing a strategic (i.e., long-range, atomic-capable) air force of its own. It could not, however, prevent the Navy from equipping its carrier-based aircraft with atomic weapons. The Air Force also managed to fend off the 1949 so-called "Revolt of the Admirals," who sought to derail the Air Force's B-36 long-range bomber in order to restore funding for a new type of aircraft carrier and even lay claim to the strategic nuclear mission using carrier-based aircraft.¹⁸ Also that year, SAC was authorized by the JCS to direct the strategic air offensive, "assigning targets, weight of effort, and timing of air operations; and [coordinating] with theater air activities to prevent interference between forces and secure maximum tactical advantages."¹⁹

Internationally, Cold War tensions flare over successive crises: Berlin in 1948; the Soviet Union's first atomic weapons test in 1949, which shattered the U.S. nuclear monopoly; and the outbreak of the Korean War the following year. In effect, North Korea's invasion of U.S.-backed South Korea in June 1950 was the first real test of nuclear-conventional synchronization in wartime. As such, it came early in the Cold War, just as the U.S. military was grappling with the meaning of nuclear weapons and the Air Force was asserting its independence. The conflict revealed much about the state of U.S. planning at the time: a heavy reliance on the Air Force to deliver atomic bombs, lack of tactical applications of nuclear firepower, cumbersome military operations due to civilian physical custody of nuclear weapons and the critical influence of the president in

¹⁷ Kohn and Harahan, *op. cit.*, 95-96.

¹⁸ See Chapter Two, 99, n. 13.

¹⁹ Robert Frank Futrell, *Ideas, Concepts, Doctrine: A History of Basic Thinking in the United States Air Force, 1907-1960, Volume I* (Maxwell Air Force Base, AL: Air University, December 1989), 200-201. Hereafter referred to as Futrell, *Vol I*, 1989.

setting nuclear policy. By the end of the conflict in 1953-1954, the Air Force's strong nuclear preference had been established, as well as U.S. production of tactical atomic munitions;²⁰ military custody of nuclear weapons, which increased operational readiness; and presidential guidance equating nuclear and conventional weapons.

Fear that the North Korean invasion was a prelude to a larger Soviet attack against U.S. interests ran high in Washington. In his very first meeting with advisors on the war, President Truman asked the Air Force Chief of Staff if it would be possible to knock out Soviet air bases in the Far East. General Vandenberg replied that it "might take some time," presumably referring to conventional methods, but added, "it could be done if we used A-bombs."²¹ Thus, for the Air Force, nuclear weapons were just bigger, more efficient bombs. Truman immediately decided that the USAF should "prepare plans to wipe out all Soviet air bases in the Far East..."²² Vandenberg also oversaw the dispatch of two B-29 groups to drop conventional bombs on North Korean supply lines. This deployment was not popular within SAC, as it diverted to the conventional fight resources needed for what it saw as the more important air-atomic campaign against the USSR, nor was it particularly effective. Indeed, air support to U.S.-led ground forces in Korea on the whole was a disappointment. Vandenberg's desire to counter this negative impression of the Air Force led him to arrange for the deployment of B-29 bombers to Britain as a show of force to Moscow, essentially repeating a move from the 1948 Berlin Crisis.²³

²⁰ The first U.S. tactical atomic weapons, the Mark 9 280 mm artillery shell and the Mark 7 bomb and missile warhead, entered production in 1952-1953. Indeed, the Mark 7 had its production schedule accelerated due to the Korean War. See, for example, *History of the MK 7 Bomb*, Sandia National Laboratory, April 1967, Declassified/Redacted. Available at *Pfeiffer Nuclear Weapon and National Security Archive*, "Warhead and Weapon Histories" folder, <https://osf.io/46sfd/>. The first U.S. full-scale test of an experimental thermonuclear device also occurred during the Korean War, in October 1952. See, *United States Nuclear Tests: July 1945 Through September 1992*, U.S. Department of Energy, September 2015.

²¹ "Memorandum of Conversation, by the Ambassador at Large (Jessup), June 25, 1950," in *Foreign Relations of the United States (hereafter FRUS), 1950, Korea, Volume VII*, Document 86, <https://history.state.gov/historicaldocuments/frus1950v07/d86>.

²² Atomic weapons were not specified in that presidential guidance, nor were they precluded. *Ibid*

²³ Roger Dingman, "Atomic Diplomacy During the Korean War," *International Security* 13, no. 3 (Winter 1988/89): 57.

An important distinction was that LeMay persuaded U.S. and British leaders that the bombers should now be loaded with atomic bomb assemblies minus their nuclear cores, which would remain in the United States under the control of the civilian Atomic Energy Commission (AEC).²⁴ Vandenberg also successfully pressed for such nuclear-configured B-29 bombers to be sent to Guam, with Truman approving the deployments on July 30th.²⁵ While not ideal by Air Force standards, this half measure would significantly improve SAC's readiness to carry out nuclear missions and move the Air Force closer to custody of fully-armed atomic bombs.

Enthusiasm for the use of atomic weapons in Korea varied within the U.S. military and even the Air Force. Continuously eying the Soviet Union, LeMay, for instance, opposed the use of atomic weapons in Korea.²⁶ Army Chief of Staff General Collins worried even at this early stage of Soviet nuclear development that U.S. forces in Korea, which relied heavily on ports, air bases, and ammo dumps, were more vulnerable to atomic attacks than the Communists.²⁷ The JCS and the wider National Security Council (NSC) expressed concern that a non-decisive use of atomic weapons in Korea could reduce their general deterrent value.²⁸ Part of the problem stemmed from the unsuitability of the technology then available – high-flyin B-29 bombers and early-generation atomic gravity bombs – to the tactical problem of enemy infantry dispersed and dug into trenches. Reflectin some of the earliest thinking about synchronization,

²⁴ Malcom MacMillan Craig, "The Truman Administration and Non-Use of the Atomic Bomb During the Korean War, June 1950 to January 1953," Master's Thesis, Victoria University of Wellington, 2009, 27-28, <https://researcharchive.vuw.ac.nz/xmlui/bitstream/handle/10063/1310/thesis.pdf?sequence=1>.

²⁵ Dingman, *op. cit.*, 61-63. Pressing for its own atomic mission, the Navy also secured the deployment of non-nuclear components of atomic bombs aboard the aircraft carrier *Coral Sea* at this time. Craig, *op. cit.*, 28.

²⁶ Dingman, *op. cit.*, 66, n. 80.

²⁷ Robert J. Valentine, "Decisiveness: The Real Calculus of Nuclear Weapons-Use," Doctoral Thesis, University of Chicago, August 2016, 95-96, <https://knowledge.uchicago.edu/record/565?ln=en>.

²⁸ "Note by the Executive Secretary (Lay) to the National Security Council, April 2, 1953," in *FRUS, 1952-1954, Korea, Vol XV, Part 1*, 838- 850, https://history.state.gov/historicaldocuments/frus1952-54v15p1/pg_838.

U.S. military planners considered using conventional military thrusts to force North Korean – and after the October 1950 intervention, Chinese – troops into kill zones where B-29s could then drop atomic bombs on them.²⁹ Among the drawbacks to such planning, virtually no U.S. or allied personnel had by this point been trained to operate on a nuclear battlefield.³⁰ General MacArthur, who led the Far East Command (FEC) and the Allied forces in South Korea, proposed to “sever Korea from Manchuria by laying a field of radioactive wastes – the by-products of atomic [weapons] manufacture – across all the major lines of enemy supply.”³¹ Apart from some hawkish congressmen, there was little support for the general’s plan to dump radioactive waste on North Korea.

After MacArthur successfully counter-attacked with an amphibious landing at Inchon and the situation improved, the nuclear-configure bombers returned from Guam to the United States in September 1950. Yet, fear of major Soviet and/or Chinese air attacks against U.S. and Allied troops in Korea in April 1951 prompted President Truman to send B-29s back to the island, but this time armed with *complete* atomic weapons – the first such deployment outside the United States for wartime use since 1945. This required the AEC to turn over nine fully functional weapons to SAC.³² The AEC obtained Truman’s assurance that the A-bombs would not be used prior to further consideration by the NSC.³³ Following Truman’s firing of MacArthur for insubordination, the JCS informed the new top U.S. commander in Korea, General Mathew Ridgway, that he was being given authority to retaliate with atomic weapons for a major air attack launched from China or the USSR, subject to further JCS approval.³⁴ Once the dire threat of massed Communist air attacks passed, the nine bombers

²⁹ One such concept involved the use of mustard gas to kill or force enemy troops out of their dugouts. See Nina Tannenwald, “The Nuclear Taboo: The United States and the Normative Basis of Nuclear Non-Use,” *International Organization* 53, no. 3 (Summer 1999): 449. Available at: <https://library.fes.de/libalt/journals/swetsfulltext/7064286.pdf>.

³⁰ *Ibid.*, 446.

³¹ Craig, *op. cit.*, 94.

³² Dingman, *op. cit.*, 72.

³³ Craig, *op. cit.*, 95.

³⁴ *Ibid.*, 99.

(and their nuclear weapons) were returned to the United States in late June 1951, but the precedent of military custody of complete nuclear weapons had been set.

This geographical division of labor, whereby the close-in battle would be fought by conventional land-sea-air forces while critical military targets in the rear would be struck with atomic bombs, amounted to a proto-joint doctrine for nuclear-conventional synchronization.

The B-29 deployments to Guam in the summer of 1950 and the spring of 1951 arguably represent the U.S. military's first go at a joint doctrine of nuclear-conventional synchronization, tentative and driven by wartime exigencies, as it were. The "doctrine" was Air Force-dominant, reflecting both the heavy dependency

on the B-29 bomber and the targets of greatest interest to the USAF. In effect, conventional land-sea-air operations would obtain vis-a-vis the Korean peninsula while SAC was poised to drop atomic bombs on distant Soviet and Chinese air bases in the event those bases were used to attack U.S. troops in Korea.

Tighter coupling of nuclear and conventional operations to produce a decisive battlefield outcome were desired and indeed investigated in real time. In March 1951, the Operations Research Office of Johns Hopkins University, working under contract to the Federal Energy Commission (FEC), contended that suitable targets for tactical use of atomic weapons existed in Korea if reconnaissance and bomber response times could be improved.³⁵ That fall, B-29 bombers conducted a series of simulated atomic bombing runs over North Korea under the code name HUDSON HARBOR to test such propositions. Afterwards, however, senior Air Force

³⁵ L.H. Rumbaugh, J.B. Green, S.H. Turkel, and H.W. Brackney, *Tactical Employment of Atomic Weapons*, Operations Research Office, The Johns Hopkins University, March 1951, Declassified. Available at: <https://nautilus.org/napsnet/napsnet-special-reports/tactical-employment-of-atomic-weapons/>.

commanders concluded that Korea presented no suitable atomic targets, tactical or strategic. Moreover, “dissipation of the [atomic] stockpile without decisive results would lessen the Soviet regard for U.S. capabilities.”³⁶

With the succession of Truman by Eisenhower in January 1953, the new president inherited the atomic conundrums of the Korean conflict but also brought a different attitude toward the use of nuclear weapons. Whereas Truman was evidently burdened morally by his use of nuclear weapons against Japan and reluctant to use them again unless absolutely necessary,³⁷ Eisenhower was intent to prove their military utility on the battlefield and their overall cost-effectiveness. In NSC deliberations over the war, Eisenhower opined that “we have got to consider the atomic bomb as simply another weapon in our arsenal”³⁸ and that “it might be cheaper, dollar-wise, to use atomic weapons in Korea than to continue to use conventional weapons against the [enemy’s] dugouts...[particularly] if one took into account the logistic costs of getting conventional ammunition from this country to the front lines.”³⁹

Fearing the drain of a stalemated conflict on overall military readiness, the JCS overcame its prior hesitancy and recommended to the president the use of atomic weapons against China to achieve a favorable settlement of the Korean War.⁴⁰ Short of making a full commitment to nuclear use, Eisenhower expressed concerns about possible Soviet retaliatory attacks against Japan but acknowledged that if the United States were forced

³⁶ Craig, *op. cit.*, 120-121, 126-127.

³⁷ Tannenwald, *op. cit.*, 446.

³⁸ “Memorandum of Discussion at the 143d Meeting of the National Security Council, Wednesday, May 6, 1953,” in *FRUS, 1952-1954, Korea, Volume XV, Part 1*, Document 500, <https://history.state.gov/historicaldocuments/frus1952-54v15p1/d500>.

³⁹ “Memorandum of Discussion at the 144th Meeting of the National Security Council, Wednesday May 13, 1953,” in *FRUS, 1952-1954, Korea, Volume XV, Part 1*, Document 515, <https://history.state.gov/historicaldocuments/frus1952-54v15p1/d515>.

⁴⁰ See “Note by the Executive Secretary (Lay) to the National Security Council, April 2, 1953,” in *FRUS, 1952-1954, Korea, Vol XV, Part 1*, 838- 850, https://history.state.gov/historicaldocuments/frus1952-54v15p1/pg_838. See also “Memorandum of Discussion at the 144th Meeting of the National Security Council, Wednesday May 13, 1953,” *op. cit.*

to expand its effort in Korea, the JCS plan was suitable.⁴¹ Fortunately, China soon agreed to an armistice ending the fighting in July 1953, but the JCS remained concerned. In October, Admiral Radford, the new Chairman, Joint Chiefs of Staff (CJCS), pointedly asked the president if the JCS could count on the use of nuclear weapons if the armistice was broken. “Eisenhower observed that allied public opinion would have to be prepared first if nuclear weapons were to be used, with the president adding that their use might cause a ‘dangerous breach in allied solidarity.’” Nevertheless, Eisenhower concluded, ‘we should use the bomb in Korea if the aggression is renewed.’”⁴² Eisenhower “added that he did not expect that cities would be bombed; only areas that were ‘directly supporting’ armed Communist forces.”⁴³ Radford continued to press the president, noting at a January NSC meeting that it would take the military 22 hours to initiate nuclear strikes following a Communist resumption of major hostilities in Korea:

Radford pointed out that there were over twenty airfield that military commanders in the area would want to knock out. Eisenhower replied that he understood this, and was confident that U.S. forces would promptly attack these bases with conventional armaments. Though the decision to use nuclear weapons would be solely his, the president made it clear that it would be made quickly. “Our people,” continued the president, “have understood the atomic weapon, but must be a little patient with our allies, who had not as yet fully grasped the import of atomic warfare.”⁴⁴

⁴¹ Although the United States was not the aggressor, its experience in Korea may well reflect some of the pressures and calculations Russia faces in the war it launched against Ukraine. In essence, consideration of nuclear weapons to break a stalemated conflict is not a Russian innovation, and the downsides (i.e., lack of suitable targets, the reputational costs of ineffective nuclear use, potential peer adversary intervention, and international opprobrium) are significant

⁴² Michael Gordon Jackson, “Beyond Brinkmanship: Eisenhower, Nuclear War Fighting, and Korea, 1953-1968,” *Presidential Studies Quarterly* 35, no. 1 (March 2005), 57. Available at: <https://onlinelibrary.wiley.com/doi/epdf/10.1111/j.1741-5705.2004.00235.x>.

⁴³ Ibid., 59-60, quoting the notes of Secretary of State Dulles

⁴⁴ Ibid., 60-61.

Thus, Eisenhower had his own concept of nuclear-conventional synchronization, namely, the military would be expected to conduct strictly conventional operations in the Far East for the first 24 hours, until it could be made clear to Allies and the American people that the Communists were the aggressors and therefore recourse to atomic weapons was justified. He had taken the steps to implement such a posture by authorizing, in the summer of 1953, the transfer of completed nuclear weapons to military custody for overseas deployment.⁴⁵ With such presidential assurances, the Air Force and the other services could invest confidently in nuclear weapons and plans for their use.

Korea reversed the course of declining defense budgets. By 1950, the U.S. stockpile of atomic bombs had increased five-fold since 1946 to more than 50 while the number of atomic-capable B-29 bombers grew ten-fold to 225.⁴⁶ In particular:

The Korean War was the real turning point for SAC. In December 1949, SAC had 72,000 men, 14 bomb groups and 610 strategic aircraft, 2 strategic fighter groups, and 6 air refueling squadrons. Four years later, LeMay had 171,000 men, 37 bomb wings and over 1,000 strategic aircraft (mostly B-36s and all-jet B-47s), 6 fighter wings, and 28 air refueling squadrons.⁴⁷

During the Korean War, SAC found itself in a quandary. Its focus remained on preparing for the air-atomic offensive against the Soviet Union yet the Chief of Staff of the Air Force (CSAF) Hoyt Vandenberg dispatched two SAC B-29 groups to drop conventional bombs on North Korean supply lines. Dismayed with this diversion and limited application of strategic air power, LeMay quietly proposed to the Pentagon that “we ought to turn SAC loose with incendiaries on some North Korean towns.” This proposal was rejected because it would create too many civilian

⁴⁵ Dingman, *op. cit.*, 87-88, n. 198.

⁴⁶ Kohn and Harahan, *op. cit.*, 95, n. 106.

⁴⁷ Greenwood, *op. cit.*, 236.

casualties. LeMay later lamented that Korea had been a lesson in “How not to use the strategic air weapon,” as “we never did hit a strategic target,” that is, an urban-industrial center that supported the enemy’s war-making capacity. Disapproving of the Korea mission, LeMay sent his least capable B-29 units, “Because I did not want to destroy the capability that we had built up for a strategic war if we had to go to war. We sent the outfit that were not fully manned and not combat ready for the overall strategic war plan.” The perceived misapplication of strategic bombers in a limited conflict would revisit LeMay just prior to his retirement from the Air Force in 1965.⁴⁸

While the bomber generals were fixate on the air-atomic offensive against the Soviet heartland, other quarters were calling attention to theater-level needs. In January 1950, the JCS assigned to SAC a new mission, retarding the advance of the Soviet army across Europe. Now that the United States was committed to the defense of NATO, the retardation mission was imposed largely at the request of the U.S. Army, which at the time lacked any nuclear firepower of its own.⁴⁹ It was fueled by the conclusion of the Harmon Committee the previous spring that even if SAC implemented its air-atomic offensive against Soviet urban-industrial targets perfectly, it would not prevent the Red Army from seizing Western Europe.⁵⁰ An atomic mission once again fell to the Air Force because only SAC possessed the heavy bombers needed to carry it out.⁵¹ SAC was ambivalent about the retardation mission, however, as it was a distraction from its preferred doctrine, the nuclear stockpile was still quite small, and armies on the move were hard to target at the time. Yet, SAC and the Air Force were reluctant to give up the mission, fearing its loss to another command or service.⁵²

⁴⁸ This episode is recounted in Kohn and Harahan, *op. cit.*, 86-88, from which the quotes are drawn.

⁴⁹ George F. Lemmer, *The Air Force and Strategic Deterrence, 1951-1960*, USAF Historical Division Liaison Office, December 1967, 55

⁵⁰ Lieutenant General H.R. Harmon, USAF, et al, *Report by the Ad Hoc Committee*, JCS 1953/1, 12 May, 1949, Declassified, 6

⁵¹ Robert Frank Futrell, *Ideas, Concepts, Doctrine: A History of Basic Thinking in the United States Air Force, 1907-1964, Volume I* (Maxwell Air Force Base, AL: Air University, June 1971), 394. Hereafter referred to as Futrell, *Vol I*, 1971.

⁵² Lemmer, *op. cit.*, 56.

Air Force doctrine at this time continued to emphasize atomic bombardment, including at the theater level. In spring 1954, Air Force Manual (AFM) 1-6, *Employment of Atomic Weapons in Theater Air Operations*, was issued at the Secret level.⁵³ It was accompanied by the unclassified AFM 1-3, *Theater Air Operations*. AFM 1-3 made clear that theater air operations were of secondary importance to the air-atomic offensive:

[T]he nature of certain implements of war provide for attack directly against the vital elements of a nation, the heartland and its hard core of elements necessary to the national existence, while others may be used to best advantage in homeland defense or in *peripheral* action.

Heartland actions are conducted by strategic striking forces; *peripheral actions are carried on by theater forces....* Being integral parts of the same global strategy, the actions of all of these forces are interrelated and mutually interdependent in terms of the effects they produce. *Strategic forces can be used in theater action and theater air forces can used in heartland action when the occasion merits.*

*Heartland action is designed to be decisive in terms of overall military strategy.... Peripheral action is primarily designed to create and exploit situations favorable for decisive military operations compatible with the strategy for the conduct of the war.*⁵⁴

At the same time, technological advances had the effect of blurring the distinction between strategic and tactical airpower: lightweight thermonuclear weapons, jet fighters able to deliver them, and airborne refueling to extend the fighters' range.⁵⁵ The blurring effect was also evident in SAC's force posture. As the repository of nearly all Air Force combat power, SAC also commanded a number of fighter squadrons,

⁵³ Colonel Royal H. Roussel, USAF, "The Air Force Doctrinal Manuals," *Air University Quarterly Review* 7, no. 1 (Spring 1954): 127. See also Departments of the Army, the Navy, and the Air Force, *Field Press Censorship* (AFM 190-5), June 1967, 40.

⁵⁴ U.S. Air Force Manual 1-3, *Theater Air Operations*, 1 April 1954, 1. Emphasis added.

⁵⁵ Lemmer, *op. cit.*, 56.

including those equipped with the new F-84 jet fighter. Originally intended to escort its heavy bombers, SAC repurposed the fighter in 1952 as theater nuclear strike aircraft. “SAC planned to fly F-84s from the United States to Europe, refueling along the way. Once at their European bases, they would take on nuclear weapons and fly to their Soviet targets,” a collection of “enemy airdromes, guided missile launching sites, key radar control centers, and other targets deep in enemy territory.”⁵⁶ Arguably, this resembled more of a separate air war fought with nuclear weapons than a joint theater plan to turn back the principal threat – a Soviet land offensive.⁵⁷

Further blurring the picture was the decision by the Air Force in 1950 to prepare the Tactical Air Command (TAC) also to deliver atomic weapons.⁵⁸ TAC, which had been created alongside SAC (and Air Defense Command) in 1946, experienced a revival due to the inadequacy of close air support (CAS) of ground forces in the Korean War. As the newer lightweight nuclear weapons entered the arsenal in 1952, the JCS began allocating them to theater commanders for employment by naval aircraft and theater air forces. By May 1952, TAC deployed its first nuclear-capable F-84 fighter wing to the United Kingdom in support of NATO (see Figure 11).⁵⁹ Because of the growing need to coordinate theater and strategic nuclear use, the JCS also directed the Air Force to establish a jointly staffed war room in the Pentagon and a joint coordination center in Europe (known as “SAC Zebra”) and the Far East (“SAC Xray”).⁶⁰

The nuclearization of the tactical air arm was viewed warily by SAC, as it would make TAC an internal competitor for funding and mission priority. This wariness was evident in the reaction to Project Vista, a California Institute of Technology study funded by the Army, Navy, and Air Force in 1951-1952. Vista concluded that while conventional forces would

⁵⁶ Marshall Michel, “Exit Strategy,” *Air & Space Magazine*, May 2003.

⁵⁷ The same could be said about U.S. Navy planning at this time. See Chapter Two, 109.

⁵⁸ Alfred Goldberg, ed., *A History of the United States Air Force, 1907-1957* (Princeton, NJ: D. Van Nostrand Company, Inc., 1957), 144.

⁵⁹ Ibid.

⁶⁰ Lemmer, *op. cit.*, 391.



Figure 11: TAC F-84 equipped with double-striped Mk-7 nuclear bomb. Photo credit: Chuck Hansen.

continue to carry the burden of defending Western Europe in the near term, the United States should exploit its advantage in tactical nuclear weapons and emphasize their use against Soviet airfield in Eastern Europe and in support of ground

forces. Pending the fielding of atomic close support missiles by the Army, the study called for increased emphasis on tactical aircraft and proposed a Tactical Atomic Air Force (TAAF) in Europe, one that would command all tactical aircraft that were capable of delivering atomic weapons. Fearing a diversion of resources from SAC, Air Force leaders suppressed the Project Vista report on security grounds, effectively burying it until its declassification in 1980.⁶¹ Instead of creating a TAAF, Air Force leadership actively debated consolidating SAC and TAC. In 1954, former Air Force Secretary Thomas Finletter called for merging all air units with atomic weapons under a single command, a strategic-tactical air command or STAC.⁶² General LeMay similarly called for TAC and SAC to merge in an “Air Offensive Command” under a single commander.⁶³ But TAC had sufficient support within the Air Force to resist being absorbed. Indeed, SAC divested its fighters to TAC by 1957, which was a more logical fit and would support the air-atomic offensive in any event.⁶⁴

⁶¹ This account is taken from David C. Elliot, “Project Vista and Nuclear Weapons in Europe,” *International Security* 11, no. 1 (Summer 1986): 163-183.

⁶² Futrell, *Vol I*, 1989, 440-441.

⁶³ *Ibid.*, 441.

⁶⁴ Goldberg, *op. cit.*, 125.

Upon assuming command of TAC in 1954, General Otto Weyland, a World War II tactical air commander who flew in support of General Patton's 3rd Army, set about reinvigorating it. He pointed out that SAC was poorly suited to theater warfare, as it would detract from its strategic air offensive. He soon became bogged down, however, in internecine warfare between the Air Force and Army as to who was in charge when it came to directing nuclear air strikes in support of ground forces. These tensions had become so high, in fact, that the two services stopped conducting joint exercises and moved to separate, parallel training, a turning point that hindered joint doctrine on conventional-nuclear integration for the duration of the Cold War.⁶⁵

To save what he could of the tactical force in the shift of resources to SAC, Weyland increasingly moved TAC from conventional to nuclear weapons.⁶⁶ By 1957, nearly all of TAC's aircraft, some 1,400 in all, were nuclear capable.⁶⁷ Tactical air power advocates were unenthusiastic about this shift but thought it preferable to absorption by SAC and the loss of any capability to support ground operations.⁶⁸ The move to nuclear operations was reflected in TAC training priorities:

In 1954, only two F-86 wings received intensive atomic training and then deployed to Europe, with the rest of TAC's forces obtaining a secondary qualification in atomic delivery. By the fall of 1955, however, atomic delivery superseded all other priorities for fighter-bomber aircrews and a comparatively limited amount of training for the delivery of conventional ordnance.⁶⁹

⁶⁵ This struggle is detailed in Ralph D. Bald, *Air Force Participation in Army-Air Force Training Exercises, 1951-1954*, USAF Historical Division, Research Studies Institute, Air University, September 1957.

⁶⁶ John Schlight, *Help from Above: Air Force Close Support of the Army, 1946-1973*, Air Force History and Museums Program, 2003, 182.

⁶⁷ Goldberg, *op. cit.*, 144.

⁶⁸ Schlight, *op. cit.*, 183.

⁶⁹ Philip M. Johnson, "Casting Off the Shadow: Tactical Air Command from Air Force Independence to the Vietnam War," Master's Thesis, Ohio University, August 2014, 63.

Simple hardware constraints reinforced the nuclear bias at the expense of dual capability:

One practical problem that complicated attempts to use the aircraft in dual delivery roles was the many hours required to physically reconfigure the planes from one type of operation to the other. A large part of the difficulty arose from the need for different pylons for conventional and nuclear weapons. Throughout 1956 the Air Force's Research and Development Command was unable to come up with a universal pylon that could serve both types of munitions.⁷⁰

To alleviate the delays in switching out weapons pylons, field commanders recommended that some squadrons be dedicated to conventional weapons delivery while others specialize in nuclear weapons. This would have helped ensure dual capability at least at the higher, wing level but the proposal was rejected by TAC leadership, which remained officially committed to dual capability within squadrons.⁷¹ In reality, the pressure to arm TAC strike aircraft with nuclear weapons at the outset of a Warsaw Pact invasion would have been high. Conventional munitions were in short supply, which further skewed training towards practice of nuclear delivery,⁷² and Soviet nuclear strikes against airbases could have precluded any type of re-arming, so better for TAC to use its biggest weapons first.

Major atomic exercises conducted in 1955, such as SAGEBRUSH, helped raise awareness of airbase vulnerability. As TAC's Director of Plans Major General John Stevenson observed:

⁷⁰ One of the Army's complaints in Exercise SAGEBRUSH was that, "even when weather and available aircraft made [conventional] close fire support possible, the Army's requirements could not be completely met due to the Air Force's preference for using atomic weapons and arming their planes accordingly." Schlight, *op. cit.*, 184, 210.

⁷¹ *Ibid.*, 184.

⁷² *Ibid.*

No longer does the force with numerical air superiority necessarily enjoy air superiority. Air superiority cannot be established as long as the opposing force retains any bases from which to launch a strike force with an atomic capability. One of the most important lessons learned from the [SAGEBRUSH] exercise was that the force initiating the attack attained a tremendous advantage... Although initiating an attack is not recommended, an operational concept that will give friendly forces a chance of survival during the initial phase of a nuclear war is very much needed.⁷³

The Air Force was so successful at integrating nuclear weapons that it approached sole reliance on them by the late 1950s.

TAC responded to the air base vulnerability problem with new concepts. Foremost among these was the Composite Air Strike Force (CASF) consisting of a squadron of F-100C

fighters, a squadron of F-84F fighter-bombers, a flight of B-66 tactical bombers, and a flight of RF-84F reconnaissance aircraft, all drawn from the newly activated 19th Air Force. CASF would be CONUS (Continental U.S.)-based for survivability and cost reasons, but deployed overseas to shore up local defenses in the event of crisis. The strike force was first tested in Operation MOBILE BAKER in September 1956.⁷⁴ With in-flight refueling, the F-100Cs crossed the Atlantic in under five hours. After arriving in Europe, the nuclear-capable strike aircraft participated in an operational exercise. As 19th Air Force Commander Brigadier General Henry Viccellio declared, "As SAC is a deterrent to major war, so will the Composite Air Strike Force be a deterrent to limited war."⁷⁵

Another concept to reduce first-strike vulnerability was to keep two squadrons of a fighter group back in the United States and rotate a third squadron to Europe.⁷⁶

⁷³ Futrell, *Vol I*, 1989, 523.

⁷⁴ MOBILE BAKER is documented in *Air Strike Force*, a film produced by North American Aviation, Incorporated, with the support of TAC and DoD. Available at: <https://www.youtube.com/watch?v=iMS35Fz97Fg>.

⁷⁵ Futrell, *Vol I*, 1989, 450.

⁷⁶ *Ibid.*, 524.

Weyland viewed atomic weapons as force multipliers for TAC: “With nuclear weapons, these forces can be compact and yet be so effective as to provide the decisive balance of power.”⁷⁷ He went so far as to assert that tactical nuclear weapons were not even weapons of mass destruction, as they could be selectively employed against military targets.⁷⁸

Such was the enthusiasm for nuclear weapons that senior Air Force leaders sought to divest the service of its remaining conventional weapons. As Air Force Chief of Staff General Nathan Twining opined in June 1956, “We cannot afford to keep in our Armed Force conventional forces for the old type of warfare plus those for atomic warfare. We have got to make up our minds that we have to go one way or the other.”⁷⁹ Such thinking was reflected in the pages of the *Air University Quarterly Review*, which featured a major study of atomic weapons and theater warfare in 1954-1955.⁸⁰ In August 1956, the Air Force Deputy Chief of Staff for Development directed the Air Research Development Command to limit future development of conventional high explosive weapons to those required for employment from already-operational aircraft.⁸¹ At a commanders’ conference in April 1957, it was agreed that the Air Force should seek to make a “continued and increased effort to eliminate the high explosive requirement from the national policy.”⁸² General Weyland was not prepared to go that far, however:

⁷⁷ Ibid., 459.

⁷⁸ Ibid.

⁷⁹ Ibid., 458.

⁸⁰ “Now the question for decision is how long we can afford, or even risk, retaining a progressively decreasing conventional capability, good only for limited use, in face of an increasing and more diversified atomic threat.... By trying to be strong in both conventional and atomic capabilities during the transition, we may become weak in both. At best, money and time will be wasted on obsolete weapons.” See, Col. Robert C. Richardson, III, USAF, “Atomic Weapons and Theater Warfare,” Parts I & II, *Air University Quarterly Review* 7, no. 3 (Winter 1954-1955): 6-9.

⁸¹ Futrell, *Vol I*, 1971, 418.

⁸² Then-Vice Chief of the Air Staff General Thomas White, quoted in Futrell, *Vol I*, 1989, 461.

Weyland wrote [then-Vice Chief of Staff] General White that if he were willing to think solely as an Air Force officer he could join in a policy of replacing conventional weapons with nuclear weapons because it would make the Air Force job so much easier, but as an individual charged with upholding national policy Weyland could not accept a course of action that could eventually undermine national policy.⁸³

In his letter, Weyland identified the risks of relying exclusively on nuclear weapons, proposed only a modest effort to retain conventional weapons, and left open the possibility that sole reliance on nuclear weapons might one day be feasible:

I can visualize local war situations arising where the threat of only atomic retaliation would severely prescribe the U.S. bargaining position at the conference table and turn the mass of human opinion against us, whereas possessing a conventional retaliation, could place world opinion on our side.... I do not foster a large and expensive program, but rather a modest program to meet the limited requirements of a local war and the aircraft we visualize now and in the future. I, therefore, believe our policy must be to continue retention and modernization of a conventional capability until such time as small atomic weapons, pinpoint delivery systems, and world education reach the point of reliability and acceptance so as to permit elimination of conventional weapons, yet retain the proper environment in which our national policy can thrive and be effective.⁸⁴

Weyland also rejected a claim by SAC that it could fight a local war without compromising its strategic nuclear posture:

⁸³ Ibid., 461-462.

⁸⁴ Ibid., 462.

I don't think any unbiased Air Force officer visualizes B-52s finding and dropping weapons on a small guerrilla troop concentration in the jungles of Indo-China.... I not only think it illogical, but feel that it would be a pure malemployment of such an expensive force when we can do the job better and more economically with tactical air forces.⁸⁵

At a follow up commanders' conference in August, the Air Force solidified its stance on limited wars. On the one hand, it acknowledged that limited war operations "could be supported from available [conventional] stocks and facilities, provided some minimum calculated risks were assumed" – an apparent concession to General Weyland that conventional weapons would be retained but at a low level. On the other hand, the Air Force decided that SAC could participate in local wars "to an extent not appreciably affecting its general [i.e., strategic nuclear] war posture."⁸⁶ This was a concession to LeMay, who had just become Vice Chief of the Air Staff. Evidently satisfied with this trade-off, Weyland dropped his opposition and began publicly supporting SAC's role in limited wars.

The Air Force's near exclusive focus on nuclear weapons left it unprepared for air-to-air combat and conventional bombing. The service also lacked enough pilots and conventional munitions for sustained air operations.

The extent of risk the Air Force had accepted with respect to conventional weapons began to show in Cold War crises. For instance, during the 1958 U.S. military intervention in Lebanon, CASF crews deployed to Adana, Turkey to provide air support. While the crews were all fully qualified to deliver nuclear weapons, they were poorly

trained and ill-prepared to deliver conventional weapons. A TAC office

⁸⁵ Ibid.

⁸⁶ Ibid., 462-464.

who inspected the units had considerable doubt that they could have even performed conventional weapon delivery missions if called upon.⁸⁷



Figure 12: TAC performing nuclear loading drill on F-100, 1962. Photo credit: U.S. Air Force.

The Air Force over-reliance on nuclear weapons persisted into the 1960s, despite the Kennedy and Johnson administrations' clear emphasis on conventional forces under their Flexible Response strategy. During the summer of 1962, TAC Commander General Walter Sweeney exhorted the Air Staff to accelerate conversion

of the Command's fighter-bombers so that they could deliver nuclear and conventional weapons, "because we aren't even in the ball park now."⁸⁸ As an Air Force historian noted, this imbalance had become deeply ingrained in training requirements:

Despite this nod in the direction of nonnuclear tactical air capabilities, the primary emphasis in training Air Force commanders, supervisors, aircrews, and weapons load teams, during the early 1960s, continued to be placed on the nuclear capability. Aircrew proficiency in the two main close air support aircraft, the F-100 and F-105, was still weighted in favor of nuclear proficiency. While F-100 crew members, for example, had to qualify every six months in three types of nuclear weapons delivery, be familiar with two other types, attend a refresher course, and be recertified as proficient in nuclear weapons delivery, they had to qualify only annually in nonnuclear delivery and simply be familiar with, not proficient in, delivering nonnuclear weapons. The same basic imbalance existed for F-105 aircrews.

⁸⁷ Ibid., 616.

⁸⁸ Schlight, *op. cit.*, 236.

The obstacles that aircrews encountered in obtaining adequate nonnuclear training also existed for ground crews. They received very little training in loading live conventional weapons and were hindered by the many different types of pylons needed to carry the various weapons. The F-100 had 16 different pylon configuration for attaching nuclear and nonnuclear weapons and fuel tanks. The development of a universal pylon...as yet eluded researchers.⁸⁹

Thus, nuclear weapons had been so thoroughly integrated by the early 1960s as to dominate all aspects of the Air Force – doctrine, organization, materiel, leadership, and training. The incorporation of another new technology, missiles, was more tentative, however. As noted, nuclear weapons conformed closely with the ethos of manned strategic bombers, the dominant culture of the post-World War II Air Force. In contrast, missiles were inimical to it.

Spurred by Germany's V-1 cruise missile and V-2 ballistic missile, the AAF initially showed some enthusiasm for missile development. By May 1945, the Air Staff drafted the military characteristics for a family of missiles covering all foreseeable requirements of the next decade – that is, air defense, tactical air support, and strategic bombardment.⁹⁰ The advent of the atomic bomb provided additional impetus. Immediately after Hiroshima, Air Staff officials suggested equipping missiles with atomic warheads.⁹¹ In August, the AAF initiated the Matador "pilotless aircraft" project.⁹² By the end of April 1946, the Air Materiel Command

⁸⁹ Ibid., 238-240.

⁹⁰ Max Rosenberg, *Plans and Policies for Ballistic Missile Initial Operational Capability Program*, USAF Historical Division Liaison Office, February 1960, 1.

⁹¹ Jacob Neufeld, *The Development of Ballistic Missiles in the United States Air Force, 1945-1960* (Washington, DC: Office of Air Force History, United States Air Force, 1990), 59-60. As noted in Chapter One, in April 1946, the Ordnance Department had already conceived of a 5,000 mile-range missile armed with atomic explosives. Maj. Hal D. Steward, USA, Inf., "Artillery of the Future?" *Field Artillery Journal*, Vol 36, No 6 (June 1946): 332.

⁹² Lieutenant Colonel Randall L. Lanning, USAF, *United States Air Force Ground Launched Cruise Missiles: A Study in Technology, Concepts, and Deterrence*, Air War College Research Report, Air University, United States Air Force, Maxwell Air Force Base, Alabama, 1992, 45.

(AMC) let a number of study contracts, including one to Convair for a ballistic missile with a range up to 5,000 miles. However, due to financial retrenchment and fruitless negotiations with the Manhattan Project and its successor, the AEC, the Air Force cancelled the contract in June 1947. Instead, it decided to rely on the Snark and Navaho cruise missiles then in development to meet strategic bombardment requirements.⁹³

In the fall of 1947, the Air Force once again set a requirement for atomic warheads in several missile characteristic statements, to no avail. It was not until 1949 that the AEC considered atomic energy and missiles mature enough to begin a feasibility study on combining the two technologies.⁹⁴ By then, the defense budget was under enormous pressure. As an Air Force historian noted, “This situation required the Air Force to choose between existing aircraft programs and long-term missile development. With an eye toward the immediate goal of improving the nation’s ability to deliver atomic weapons, the Air Force chose to develop aircraft and those missiles that enhanced aircraft. Long-range strategic missiles were placed eighth on the JCS list of missiles to be developed.”⁹⁵ Nonetheless, Secretary of Defense Louis A. Johnson cleared the path to mating missiles with atomic warheads in January 1950, after the Pentagon’s Hull Committee concluded that such combinations were not only feasible but that several missiles then under development could only be justified militarily and economically if they carried atomic warheads.⁹⁶ Just over a year later, Air Force Headquarters directed TAC to prepare to use guided missiles with atomic warheads.⁹⁷

In March 1954, the Air Force deployed to Bitburg Air Base in West Germany the first operational U.S. surface-to-surface missile, the Matado .

⁹³ Ibid. See also Max Rosenberg, *op. cit.*, 2.

⁹⁴ Neufeld, *op. cit.*, 60.

⁹⁵ Ibid., 37.

⁹⁶ Ibid., 60-64.

⁹⁷ Goldberg, *op. cit.*, 144.

The Matador could carry either a conventional or a nuclear warhead. TAC valued Matador because its radio-guidance system provided an all-weather, night attack capability that was in short supply among its manned aircraft. Matador was intended for use against fixed targets, such as heavily defended Warsaw Pact air bases. At the same time, it was touted as being less vulnerable than manned aircraft because it was a mobile missile. In reality, this first-generation cruise missile was cumbersome to transport, took 90 minutes to prepare for launch, and its guidance system was susceptible to jamming.⁹⁸

In contrast to the Army and Navy, Air Force development of missiles was “fragmented and badly undermanned,”⁹⁹ a reflection of its lower status compared to manned aircraft. After many reorganizations, development of guided missile policy and objectives was assigned in December 1949 to the newly established Special Weapons Team of the War Plans Division, Directorate of Plans and Operations. The Special Weapons Team also was assigned coordination of chemical, biological, and radiological weapons.¹⁰⁰ Other reorganizations and shuffling of this responsibility followed. Development of missiles was entrusted to a special Western Development Division (WDD) of the Air Research and Development Command (ARDC). A confluence of events, including technical intelligence on Soviet missile advances and successful U.S. testing of thermonuclear weapons, made development of ICBMs and IRBMs an urgent priority for the White House and certain parts of the Air Force.¹⁰¹ By the end of 1955, “WDD enjoyed top national priority, a separate budget, and an unusual degree of management freedom.”¹⁰²

Guided missiles had much opposition to overcome within the Air Staff. Reflecting the paradoxical attitudes of the bomber generals, the Air Staff deemed that missiles were not important to its mission, yet were important

⁹⁸ Lanning, *op. cit.*, 9-18, 45-48.

⁹⁹ Neufeld, *op. cit.*, 83.

¹⁰⁰ Ibid.

¹⁰¹ Ibid., 104-106,

¹⁰² Ibid., 122.

enough to prevent the Army and Navy from taking them over. Thus, Air Force Letter 136-3 (September 1952) declared that guided missiles were unproven and not revolutionary weapons; they were simply another type of aircraft. Because missiles complemented strategic air offensive operations, the Air Force argued, it should have dominant control in the missile field.¹⁰³ To reinforce this narrative, the Air Force designated the Matador cruise missile as the B-61 pilotless “bomber”¹⁰⁴ and counted it amongst its “aircraft” wings, and similarly labeled the Atlas ICBM the B-65 pilotless bomber. In its public-facing communications, the Air Force made clear that cruise and ballistic missiles “backed up” piloted aircraft.¹⁰⁵

The ostensible opposition to missiles was their unproven reliability. As retired Major General Jack Catton reflects on his time in SAC, “I think there was apprehension [about missiles] more than opposition. We were not sure whether missiles were going to replace airplanes, or supplement them. More than opposition, I think we wanted to be shown the reliability and the performance capability of the new weapon.”¹⁰⁶ LeMay similarly reminisced that he was glad to get missiles into SAC,¹⁰⁷ but he was hardly a proponent at the time. In fact, LeMay complained that ICBMs were taking funding away from the B-70 bomber, a top priority program to him.¹⁰⁸ As an Air Force historian notes:

LeMay viewed missiles principally as aids to the penetration of manned bombers. This view conflicted with official Air Force policy, which called for the speediest possible integration of missiles and aircraft. LeMay believed that the military worth

¹⁰³ Ibid., 83-89.

¹⁰⁴ Neufeld, *op. cit.*, 85, 105.

¹⁰⁵ See *Thor the IRBM*, a 1959 USAF film available at: <https://www.youtube.com/watch?v=8CRYSLtLbQ>.

¹⁰⁶ Kohn and Harahan, *op. cit.*, 100.

¹⁰⁷ Ibid., 101-102.

¹⁰⁸ William P. Head, *War from Above the Clouds: B-52 Operations During the Second Indochina War and the Effects of the Air War on Theory and Doctrine* (Maxwell Air Force Base, AL: Air University Press, July 2002), 9.

of ICBMs lay in their “political and psychological value,” but in no case would ICBMs alone “be capable of destroying the target system.”¹⁰⁹

While Catton and LeMay contended that there was no opposition to guided missiles, in reality, their development was strongly resisted by numerous Air Staff members. According to Major General Osmond Ritland, who in 1959 took command of the successor to WDD, the Ballistic Missile Division, “I think the only people that supported the [missile] program were those that were assigned to it.”¹¹⁰

The bomber generals were particularly hesitant about the IRBM, whose development was recommended to the Air Force by OSD’s Scientific Advisory Committee in January 1955. In February, the Killian Committee called for the United States to develop an IRBM before the Soviets, and the U.S. Army was working toward that end with its Jupiter IRBM, which would encroach on Air Force control of long-range missiles. Against this backdrop, the Air Staff debated and approved in spring 1955 development of an Air Force IRBM, the Thor. Initially the Air Force viewed Thor as a replacement for the Matador tactical cruise missile but decided to treat it as a strategic missile. Regardless, some senior Air Force officials opposed Thor as a resource competitor to the ICBM. In January 1959, SAC Commander General Thomas Power unsuccessfully tried to terminate Thor.¹¹¹

Despite their opposition, the bomber generals were unable to prevent the other services from developing long-range missiles.¹¹² They also were unable to prevent ICBMs from eclipsing manned bombers as the core of SAC. The number of manned bombers declined from a peak of 1,800 in

¹⁰⁹ Neufeld, *op. cit.*, 142.

¹¹⁰ Quoted in *Ibid.*, 107n.

¹¹¹ *Ibid.*, 121-122, 143n, 232.

¹¹² OSD did, however, assign control of the Army’s Jupiter missile to the Air Force, only to withdraw them from their bases in Turkey in resolution of the 1962 Cuban Missile Crisis. Jupiter missiles based in Italy also were withdrawn. See Neufeld, *op. cit.*, 232-233.

1959 to 1,500 by mid-1961, whereas the number of ICBMs increased from 12 in 1960 to 1,054 by 1967.¹¹³ After April 1964, alert ICBMs permanently overtook the number of bombers on alert.¹¹⁴ This shift largely reflected technological trends. ICBMs, particularly the Minuteman, proved their reliability and cost-effectiveness, whereas improvements in Soviet air defenses cast increasing doubts that manned strategic bombers could reach their targets.¹¹⁵

Besides seeking a greater balance of nuclear and conventional forces under the strategy of Flexible Response, the Kennedy Administration also brought tighter civilian control to the Pentagon. In this regard, Eugene Zuckert was appointed Secretary of the Air Force in 1961. Reflecting on the Air Force's reluctant transition from Massive Retaliation to Flexible Response, Zuckert observed:

It took some time for some of our old attitudes and outlooks to change; adjusting to new hardware still seems easier than adjusting to new ideas...in the realms of strategy, concepts, and doctrine.

[Some Air Force leaders] were still approaching top-level problems of national security in terms of the [air power] concepts, doctrine, and study methods of the early 1950s. There were too many who took a parochial view of the big problems of planning, programming, and budgeting; who refused to believe that national policy and strategy were what the administration said they were – not what an element of the armed forces thought they ought to be. I suppose this was a hangover from the ten or more years when we had been the principal guarantor of Free World security

¹¹³ Major Wm. Bruce Danskin, USAF, "Fall of the Fighter Generals: The Future of USAF Leadership," Thesis, School of Advanced Airpower Studies, Air University, Maxwell Air Force Base, AL, June 2001, 49-50, n. 110.

¹¹⁴ "The Strategic Air Command," *Air Force Magazine*, September 1964, 68.

¹¹⁵ Secretary of Defense McNamara, in particular, favored ICBMs over bombers as being more survivable and cost-effective. For contrasting congressional, Air Force, and OSD views on bombers vs. missiles, see Robert Frank Futrell, *Ideas, Concepts, Doctrine: A History of Basic Thinking in the United States Air Force, 1907-1964, Volume II* (Maxwell Air Force Base, AL: Air University, June 1971), 600-610.

and in many ways the favored service. In those years our nuclear superiority had made the issues of strategy more clear-cut than they were after the U.S.S.R achieved nuclear parity.¹¹⁶

The influence of this “new thinking” is evident in the August 1964 edition of AFM 1-1, *United States Air Force Basic Doctrine*. In contrast to prior assertions that air power alone could win wars, the new doctrine acknowledged, “Aerospace Forces are one part of a national military establishment maintained to support national policy objectives in our relations with foreign powers.”¹¹⁷ It also rejected the premise that total victory against a nuclear-armed power was feasible:

Since the United States seeks a world free from aggression, its military forces must develop capabilities which clearly signal to a potential enemy that war at any level cannot produce a meaningful advantage. However, the nature of modern war has altered the use of force to the extent that total victory in some situations would be an unreasonable goal. Where enemies with capabilities to destroy our urban centers are involved, we should seek military objectives more realistic than total defeat of the enemy.¹¹⁸

Recommended Read:
“National Policy on
Conflict Management,”
USAF Deputy Directorate
of Advance Planning,
November 1964.

The shift in emphasis from all-out war to denying the adversary an advantage across the spectrum of conflict was further elaborated in a statement on “National Policy and Conflict Management” published by the Air Force Deputy Directorate of Advance Planning in November 1964:

¹¹⁶ Robert Frank Futrell, *Ideas, Concepts, Doctrine: Basic Thinking in the United States Air Force, Volume II, 1961-1984* (Maxwell Air Force Base, AL: Air University Press, December 1989), 230-231. Hereafter referred to as Futrell, *Vol II*, 1989.

¹¹⁷ *Ibid.*, 235.

¹¹⁸ *Ibid.*, 233.

Although all-out counter-city nuclear holocaust would be unlikely if the United States maintained necessary deterrent capabilities, a wide spectrum of lesser conflict remained available to the Communists, who had pledged that they would use military force to attain their objectives in cases in which potential gains would exceed risks that would be involved.... To deter lesser conflicts the United States would require a capability and a determination to present an enemy with a confrontation in which the risks would be greater than the gains he might expect to achieve through a particular act of aggression. To maintain this capability the United States would require forces that would permit it the option of escalating any lesser conflict all the way to the top of the upper end of the spectrum of conflict. Thus, even though military capabilities would have to be keyed to the concept of providing military advantage at the upper end of the spectrum of conflict the United States could not permit any significant gaps to exist in its capability to handle lesser conflicts. The maintenance of this force posture would prevent an enemy from escalating a conflict to a portion of the spectrum of conflict where the vital interests of the United States or its survival might be at stake.¹¹⁹

The Deputy Directorate further assessed that:

Next to deterrence, controlled response was probably the most important item.... It prescribed the kind of military action required in the event that deterrence should fail. It ensured that military objectives would be kept in tune with political objectives and that exactly the right amounts of force would be employed to win political objectives...multiple options would seek to provide a national decisionmaker with a number of choices for responding to any particular contingency. Such options would be available when the national military posture had sufficient flexibility to permit alternative targeting plans, incremental applications of force, employments of force in both strategic and tactical missions, and responses to unforeseen contingencies.¹²⁰

¹¹⁹ Ibid., 233-234.

¹²⁰ Ibid., 234.

Moreover:

If hostilities occurred, the United States would be interested in attaining negotiation thresholds that would be advantageous points on the ladder of conflict escalation. To prevent the expansion of a lesser conflict to a level of unrestrained conflict the United States would seek to terminate a conflict at the lowest threshold at which it could attain its political objectives. The objective of war termination imposed requirements for intelligence capabilities, forces that could recover and recycle for a continuing employment in a degraded environment, reliable command and control, and continuing military capabilities for a posthostilities period.¹²¹

In essence, the Air Force Deputy Directorate had laid out a concept of escalation management. The concept implied the integrated application of force all along the spectrum of conflict. This was a far cry from the strategic air operations mantra of 1954: “Strategic air warfare is the primary offensive manifestation of national power in war because of its direct destructive influence upon the war-making potential of an enemy nation.”¹²² The primary function of forces engaged in strategic air warfare is to defeat the enemy nation.” In many respects, AFM 1-1 (1964) marked the “initial descent” of the bomber generals and nuclear domination of the Air Force, underscored by the February 1965 retirement of General Lemay, the Air Force’s last major commander of World War II. Given the institutional investment in the nuclear mission, transition to a more balanced nuclear-conventional approach would prove difficult and costly to the Air Force, as evidenced in the Vietnam War.

¹²¹ Ibid., 234-235.

¹²² Department of the Air Force, Air Force Manual (AFM) 1-8, *Strategic Air Operations*, 1 May 1954, 1.

2. Nuclear Hangover (Mid 1960s-Early 1970s)

The Air Force's second phase of nuclear and conventional synchronization spans roughly the decade of its involvement in Vietnam. It is marked by the use of SAC's centerpiece, the B-52 bomber, in a conventional role. This phase underscores the price the Air Force paid for its preoccupation with strategic nuclear warfare in the prior phase and the increasing political constraints on the application of air power generally. The phase ends with the decline of the bomber generals.

Having established a notional role for strategic air power in limited wars, the Air Force found the concept being put to the test in the unfolding conflict in Vietnam. In early 1964, the JCS amended the Joint Strategic Capability Plan to require that 30 B-52s be available for regional contingencies. By comparison, SAC was maintaining at this time an alert posture that required 12 nuclear-armed B-52s to be airborne at all times.¹²³ General William Westmoreland, Commander, Military Assistance Command, Vietnam (MACV) pressed the JCS to allow him to use conventionally-armed B-52s against the base camps of the Vietcong, armed Communist revolutionaries in South Vietnam and Cambodia. Westmoreland argued that B-52s were better suited for this job than fighter-bombers because of their carpet-bombing efficiency.¹²⁴

Early the following year, the 30 B-52s arrived in Guam to mixed views of Air Force leadership. Some senior officers were displeased that the bombers had been dispatched at all. SAC officials worried that combat losses could reduce the number of B-52s left for their primary mission, strategic nuclear bombardment.¹²⁵ Moreover, they feared that combat

¹²³ To distribute the burden, each of SAC's 12 B-52 wings was required to maintain one bomber on airborne alert 24 hours a day; no alert bomber landed until another relieved it on station. See "SAC's Deadly, Daily Dozen," *Time*, March 17, 1961. In addition, SAC maintained at this time a ground alert rate of 50 percent, meaning that one-half of the Command's bomber and aerial tankers could be launched within 15 minutes. See also Henry M. Narducci, *Strategic Air Command and the Alert Program: A Brief History*, Office of the Historian, Headquarters, Strategic Air Command, 1 April 1988.

¹²⁴ Head, *op. cit.*, 18.

¹²⁵ *Ibid.*, 18. See also, Futrell, *Vol II, op. cit.*, 282.

losses of B-52s would imply weakness and diminish their strategic deterrent effect. Other Air Force leaders were dismayed that the bombers would not be employed in a true strategic air campaign against the enemy's war-making capacity due to political sensitivities.¹²⁶ Their concerns were increasingly justified



Figure 13: SAC B-52 dropping conventional bombs over South Vietnam in an ARC LIGHT mission. Photo credit: U.S. Air Force.

refinement by the Commander in Chief, Pacific Command (CINCPAC), and approval in Washington.¹²⁷ The first ARC LIGHT mission took place in the early hours of 19 June. During aerial refueling operations, two of the 30 bombers collided and crashed into the sea, killing eight crewmembers. Another bomber aborted due to mechanical failures. Of the remaining 27 bombers, only half of their bombs hit the target box. To make matters worse, battle damage assessment determined that the Vietcong had already fled the area on a tip from a spy in the South Vietnamese army. The raid made news worldwide, being depicted as a fiasco¹²⁸ General Weyland's incredulity eight years earlier about B-52s being used to bomb guerrilla groups in Southeast Asia (SEA) was now a reality.

In May 1965, the JCS approved General Westmoreland's request to use the B-52s against the Vietcong in what became Operation ARC LIGHT. Because the B-52s had a nuclear attack mission, they would remain under SAC's control, with Westmoreland nominating targets for

That the B-52s were being used in this manner in the first place was the ironic result of the Air Force's emphasis on the strategic nuclear mission: "One of the main reasons B-52s had to do the job normally reserved

¹²⁶ Head, *op. cit.*, 17.

¹²⁷ Futrell, *Vol II*, 1989, 282

¹²⁸ Head, *op. cit.*, 19-21.

for tactical air assets was that most tactical assets were being used in Operation ROLLING THUNDER [over North Vietnam where air defenses were dense]. Another reason was the lack of fighter of the kind needed (ones that flew lower and slower) to carry out CAS or other important tactical roles, especially in the South.”¹²⁹ Other shortcomings arose. In 1965-1966, the Air Force had no conventional all-weather bombing capability in South-East Asia (SEA). This had to be retrofitted into the B-52 “D” models, for example. As sortie rates increased, the Air Force’s limited investment in conventional munitions the previous decade soon resulted in shortages affecting not just the B-52s but also the tactical aircraft carrying out ROLLING THUNDER.¹³⁰

Additionally:

As the sortie rates rose to 1,800 in March 1968, the turnover of trained pilots and crews soon caused a problem – the quantity of rated personnel was insufficient to fulfill SAC’s dual mission role during the first three years of ARC LIGHT. Pending separations, valid deferments, medical deferments, and so forth kept the number of qualified crews low, and since the skills necessary to fly nuclear and conventional bombers were different, training had to be altered in many cases to meet new requirements.¹³¹

The operational strain of SAC’s conventional mission in Vietnam negatively affected the Command’s primary nuclear mission. In late 1969, 38 percent of the regular bomber alert force (75 aircraft) were degraded

¹²⁹ Ibid., 25.

¹³⁰ The B-52Ds were also modified to carry up to 30 tons of conventional bombs under the “Big Belly” program. Ibid., 14, 23.

¹³¹ Ibid., 28-29.

During the Vietnam conflict, the Air Force underestimated the demands of sustained conventional operations on the bomber nuclear deterrence mission.

and 27 percent of the tanker force (53 aircraft) were not on alert. Of the generated alert force, 13 percent of the bombers (66 aircraft) and 8 percent of the tankers (42 aircraft) could not be brought to alert because crews were unavailable.¹³²

The preferred Air Force approach to achieving air superiority, bombing enemy air bases, was constrained in Vietnam for about three years. In addition to the political concerns about appearing too provocative, operationally such missions were opposed because U.S. aircraft losses would be too great compared to the minor damage that could be achieved by relatively inaccurate bombing. In mid-1967 when airfield attacks were finally approved, the North's MiG fighter simply dispersed across the border to sanctuary in China. Unable to destroy the fighter on the ground, the Air Force had to engage in another type of combat it had neglected because of its nuclear bombing focus, air-to-air combat:

The Tactical Air Command by the late 1950s was configured as a training base amounting to approximately 12 percent of the force, a modest training resource capable of accomplishing a tactical nuclear alert commitment worldwide, but too small for conventional fighting of protracted duration. Where training in air combat tactics had been stressed during the Korean War, the Air Force went away from such training in the 1950s, much more so than did the Navy.... As a consequence, Navy pilots were at first better prepared than the average Air Force pilot when going into combat over North Vietnam.¹³³

¹³² Narducci, *op. cit.*

¹³³ Futrell, *Vol II*, 1989, 288.

This neglect of air-to-air combat proved costly:

The numbers show just how far the U.S. fell between Korea and Vietnam. During World War II, the best figure available indicate that in Europe 7,422 enemy fighters were shot down while the U.S. lost 1,691, a ratio of 4.4:1. In Korea, the numbers were 874 to 122, or a ratio of 7.2:1. In Vietnam, the North lost 195 fighters – 139 to Air Force fighters and 56 to Navy fighters – while the U.S. lost 61 Air Force fighters and 16 Navy fighters, totaling 77. The ratio was 2.53:1.¹³⁴

Other areas of inattention lowered Air Force performance in Vietnam. Among these was electronic countermeasures:

[A] reason the Air Force gave low priority to electronic warfare was the policy of preparing for a nuclear war where attrition would not have the serious effect that it would have in a conventional war, where aircrews would go back into the same areas day after day with a great number of missions. One other result of the preoccupation with preparations for nuclear war affected the air campaign in North Vietnam. Tactical fighter crews were drilled in low-level dash and pop-up bombing, appropriate to nuclear delivery. When bombing began in North Vietnam, bombing accuracies were not good. The circular error probable (CEP) was on the order of 750 feet and several years were required to get combat circular error probable down to 365 feet. Technology for guided bombs had been known since World War II, but had not been grasped by Air Force research and development – one reason being that precise bombing accuracy was not needed for nuclear bombs.¹³⁵

In terms of SAC's centerpiece bomber, B-52 operations had mixed outcomes in Vietnam. Early ARC LIGHT missions, as noted, were of questionable effectiveness. They proved pivotal, however, in protecting

¹³⁴ Head, *op. cit.*, 25.

¹³⁵ Futrell, *Vol II*, 1989, 288.

the beleaguered U.S. Marine Corps base at Khe Sanh in early 1968. Indeed, General Westmoreland credited the B-52s with breaking the back of the North Vietnamese assault. A captured North Vietnamese officer estimated that 75 percent of his 1,800-man regiment had been killed by a single ARC LIGHT strike.¹³⁶

The growth of the ICBM force enabled the Air Force to devote half of its strategic nuclear bombers to conventional missions in Vietnam. This was an important but ad hoc form of intra-service nuclear-conventional synchronization.

Whereas President Lyndon B. Johnson had been reticent to use the B-52, his successor, Richard Nixon was less so. Nixon was reducing tensions with China and the Soviet Union in the early 1970s under the policy of détente while also trying to extricate U.S. forces from the Vietnamese conflict. This made use of the B-52s against the North in order to force it to the negotiating table

less risky politically. In February 1972, Nixon ordered an additional 161 B-52s to the region, for a total of 210 – more than half of SAC's entire strategic bomber force.¹³⁷ This meant that SAC's ICBM force increasingly was bearing the load of Air Force nuclear readiness and target coverage.¹³⁸ This leveraging one leg of the strategic nuclear triad to enable another to undertake conventional operations was serendipitous rather than pre-meditated.¹³⁹

¹³⁶ Head, *op. cit.*, 31.

¹³⁷ *Ibid.*, 64.

¹³⁸ Recall that as of April 1964, the ICBM force overtook the bomber force in terms of delivery systems on alert.

¹³⁹ As noted earlier, Air Force doctrine in the late 1950s allowed strategic bombers to participate in theater level conflicts but only to the extent it did not impair their nuclear mission. Air Force leadership was skeptical of ICBMs at the time and would not have looked to them to pick up any slack from bombers engaged in conventional conflict.

To impress upon North Vietnam's leadership the costs of dragging out peace talks, President Nixon authorized Operation LINEBACKER II in December 1972. The operation reflected what the bomber generals had been calling for since 1964, the use of B-52s against North Vietnam's war-making capacity: airfields, storage and power facilities, as well as rail yards in the Hanoi-Haiphong area. The first wave of the attack involved 129 B-52s and nearly 40 supporting aircraft. The bombers struck 94 percent of their targets. Three B-52s were shot down and two others were severely damaged by SAMs. Rushed and rigid planning led to repetitive and therefore predictable routing of the bombers, which increased their losses in subsequent waves. This was disconcerting to both the President, as it undercut his intended message of overwhelming power, and SAC leadership, which continued to fear any lessening in the bombers' strategic deterrent effect. Total B-52 losses during the 11 days and 729 sorties of LINEBACKER II amounted to 15 aircraft with another nine damaged – all due to SAMs. On 27 January 1973, Hanoi signed a peace agreement with Washington, bringing to an end active U.S. participation in the war.¹⁴⁰ All told, SAC flew some 125,000 B-52 combat sorties in SE Asia between June 1965-August 1973, losing 31 bombers, 18 of them over North Vietnam.¹⁴¹

The implications of the Vietnam War for the Air Force were no less controversial than the manner in which the air war was conducted. Some Air Force officers and civilians asserted that LINEBACKER II validated Air Force doctrine and that the overall conflict would have had a different outcome if political leadership had approved a strategic bombing campaign back in 1965. As noted by a prominent Air Force historian, this argument is problematic.¹⁴² With such an ambiguous outcome, Air Force doctrine and theory basically ignored the Vietnam conflict, although fighter pilot veterans vowed to ensure the Air Force was better prepared to fight a limited conventional war in the future.¹⁴³ In this regard, Vietnam seems to have marked a turning point in the fate of the bomber generals. As the aforementioned historian suggests:

¹⁴⁰ Head, *op. cit.*, 75-85

¹⁴¹ *Ibid.*, 95

¹⁴² *Ibid.*, 92-93

¹⁴³ *Ibid.*, 87-88.

While it is difficult to prove that Vietnam was the primary cause, it is interesting to note that before 1973, the CSAFs were almost all strategic bomber navigators, advocates, pilots, and experts. Subsequently, all CSAFs have had little – if any – bomber background and have been far more familiar with transport, fighter, and tactical airpower and alternative strategic and nonstrategic nonbomber airpower roles.¹⁴⁴

3. Theater Nuclear Malaise (1970s- Early 1990s)

As with the Army and Navy, the Air Force lacked doctrine for how to prevail in mixed nuclear and conventional combat at the theater level.

The third phase of Air Force nuclear and conventional synchronization spans the last two decades of the Cold War. It is characterized by a stagnation in theater nuclear war doctrine. In belated recognition that nuclear parity with the Soviets had reduced the credibility of nuclear escalation, the Air Force sought to free up aircraft for conventional missions by

shifting more of the nuclear mission to missiles. The phase ends with new Air Force ground-launched cruise missile (GLCM) deployments in Europe being cut short and then eliminated under the INF Treaty with the soon-to-collapse USSR, followed by the removal from Europe of most of the Air Force's nuclear gravity bombs under a 1991 Presidential directive.

With Air Force attention focused on strategic nuclear deterrence and the war in Vietnam, theater nuclear doctrine remained stuck in the 1950s. This was pointed out in a 1976 critique by an Air Force officer

¹⁴⁴ Ibid., 91-92.

[O]ur concept for the employment of [tactical air or TACAIR] is outdated...nuclear TACAIR has been, in concept, essentially... unchanged since 1952, when the first F-84 fighter-bomber was given a nuclear role in Europe. This role was based on a massive retaliation “trip wire” strategy, which is no longer credible. The present era of strategic parity with the Soviet Union requires more flexibility.¹⁴⁵

As noted, theater planning called for fixed targets, typically air bases, to be struck deep in Warsaw Pact territory. This conformed to Air Force doctrine on achieving air superiority by defeating the threat at its source but was also driven by technical constraints that impeded other possible missions: “Because of the way current nuclear bombs have been designed, TACAIR is somewhat limited in its ability to airburst these weapons accurately over nonfixed targets or to ground-burst ‘clean’ nuclear weapons.”¹⁴⁶ Additionally, Air Force reconnaissance capabilities were limited in their ability to track ground forces on the move.

*Recommended Read:
Reed’s “On Deterrence:
A Broadened Perspective,”
Air University Review,
May-June 1975.*

At this time, a study group appointed by the CSAF had begun to re-examine Air Force doctrine. The so-called Six Man Group was led by then-Col. Robert Reed of the Air Staff Directorate of Doctrine, Concepts, and Objectives. Writing in the *Air*

University Review, Colonel Reed highlighted a key finding of the group:

At theater and regional levels, the advent of mutual nuclear vulnerabilities has given rise to the need for much greater reliance on conventional military capabilities as the operative deterrent against threats. These capabilities are necessary in order to maintain the nuclear threshold at the highest possible level while at

¹⁴⁵ Colonel David L. Nichols, USAF, “Who Needs Nuclear TACAIR?” *Air University Review* 27, no. 3 (March-April 1976): 17.

¹⁴⁶ *Ibid.*, 22.

the same time protecting those security interests where it is neither desirable nor credible to resort to a nuclear conflict. Furthermore, the capability to conduct military operations across the spectrum of possible conflict, particularly where nuclear-capable powers are involved, is fundamental to the concept of escalation control.¹⁴⁷ In short, the Air Force was belatedly acknowledging U.S.-Soviet nuclear parity, as well as Flexible Response – nearly 15 years after the strategy was first articulated by President Kennedy.

To increase conventional force capacity, the Air Force looked to reduce the nuclear burden on its tactical aircraft in Europe, a move also supported by OSD, as noted by Secretary of Defense James Schlesinger in his 1975 statement to Congress on U.S. theater nuclear forces:

...missile systems such as Pershing and Poseidon can perform many of the strike missions against fixed targets now assigned to tactical aircraft. Under advanced states of alert, shifting more of the fixed targets from aircraft to missiles would have the major advantage of ensuring that more aircraft would be available for conventional close air support or interdiction missions.... SACEUR will be requested to initiate an analysis to identify where land-based and sea-based missiles can assume some of the strike missions of NATO tactical aircraft.¹⁴⁸

Schlesinger also disclosed to Congress the number of nuclear-capable aircraft available to the Alliance, as summarized in Table 5,¹⁴⁹ which gives a sense of the nuclear burden on TACAIR. At this time, the U.S. Navy was

¹⁴⁷ Colonel Robert H. Reed, USAF, "On Deterrence: A Broadened Perspective," *Air University Review* 26, no. 4 (May-June 1975): 8.

¹⁴⁸ Secretary of Defense James R. Schlesinger, *The Theater Nuclear Force Posture in Europe: A Report to the United States Congress in Compliance with Public Law 93-365*, April 1, 1975, 23. Declassified.

¹⁴⁹ Ibid., 7. Of these nuclear-capable aircraft, the United States was believed to allocate only 30% to 50% to the nuclear mission. See John Borawski, "Theater Nuclear Arms Control and Forward-Based Systems," *Air University Review* 33, no. 4 (May-June 1982): 14.

It seems the Navy's allocation of additional SLBM warheads to NATO in the 1970s helped free up some USAF aircraft for conventional missions, a form of inter-service nuclear-conventional synchronization.

increasing its number of SLBM warheads assigned to NATO from 80 to 400.¹⁵⁰ Thus, shifting more of the nuclear burden to missiles may have freed up some 200-300 NATO aircraft for conventional missions.¹⁵¹

U.S./Canada		European Allies	NATO Total
North America	Europe		
852-994*	408-552*	540-810**	1,800-2,356
* = The first number is tactical aircraft equipped to deliver nuclear weapons. The second number adds reconnaissance aircraft so equipped.			
** = The first number is Allied aircraft with a nuclear delivery mission. The second number adds Allied ground attack aircraft which may be similarly capable.			

Table 5: Nuclear-capable Tactical Aircraft Available to NATO, 1975.

Shifting the nuclear burden from tactical aircraft to missiles still left unaddressed how far to go and what doctrine should guide the resulting theater nuclear force. Some in the Air Force favored completely lifting the nuclear mission from TACAIR, arguing that it added little to the overall

¹⁵⁰ Raymond L. Garthoff, *Détente and Confrontation: American-Soviet Relations from Nixon to Reagan* (Washington, DC: The Brookings Institution, 1985), 850.

¹⁵¹ Simplistically assuming each fighter-bomber carried a single nuclear weapon and that SLBM warheads could be swapped on a 1:1 basis for targeting purposes meant that a maximum of 320 fighter-bombers could be freed up for conventional missions.

nuclear balance and that nuclear TACAIR bases were highly vulnerable to attack. Nuclear TACAIR proponents replied that *all* TACAIR bases were vulnerable regardless of mission. Moreover, aircraft offered greater flexibility and lower potential collateral damage than missiles. Lastly, dual-capable aircraft (DCA) were an important means for some NATO allies to participate in the nuclear mission. This sharing of nuclear risks and responsibilities was an important political benefit ¹⁵²

Commenting on the situation, retired General Bruce Holloway, former CINCUSAFE, CINCSAC, and Vice Chief of Staff, observed:

[A]ssured destruction has given way to a much wiser strategy of flexibility However, there are large gaps in the strategy, and even larger gaps in the projected weapons and force structures that must match the strategy. *The biggest gap is the lack of doctrine for employment of tactical nuclear weapons....* We have long held that nukes are not "just another weapon." We have vigorously and self-righteously preached this notion on moral grounds, and not without logic. However, it is time to set aside this Sunday-school doctrine in favor of the kind of hard planning that amalgamates the entire spectrum of weaponry. The place to start is in Europe, in the European Command and in SHAPE. In Washington, this shift must be recognized as necessary and encouraged. ¹⁵³

¹⁵² Nichols, *op. cit.*, 18.

¹⁵³ Quoted in Futrell, *Vol II*, 1989, 511. Emphasis added.

The former CINCUSAFE's comments underscored the difference between targeting plans (which existed) and a coherent, realistic operational concept to be served by them (which was lacking). To be sure, Air Force leadership bore its share of responsibility for that doctrinal gap. A 1978 contractor study team was unable to find an official published statement of Air Force battlefield nuclear employment doctrine¹⁵⁴

Another aspect of the integrated battlefield that was beginning to receive Air Force senior attention after a period of neglect was the Soviet chemical warfare threat to U.S. air bases in Europe. In June 1978, Lieutenant General Howard Fish, Assistant Vice Chief of Staff, cited as a key Air Force readiness deficiency "our capability to fight under chemical warfare conditions."¹⁵⁵ The situation bore a striking resemblance to the theater nuclear conundrum. Namely, the Air Force had been relying on a strategy of retaliation in kind to deter Soviet attack, in this case, use of chemical weapons against USAFE airbases; there were no ready solutions to recover a USAFE base from such attack;¹⁵⁶ and the Air Force was slow to adapt to changed circumstances, since the Nixon Administration had begun to lift the threat of retaliation in kind by renouncing chemical weapons nearly a decade earlier.

The doctrinal malaise continued into the 1980s. Once again, *Air University Review* served as the forum in which Air Force shortcomings on the synchronization of nuclear weapons at the theater level were aired. As one Air Force lieutenant colonel opined:

For various endemic reasons, the Air Force...has not developed a comprehensive and coherent TNF policy.... The Air Staff, for example, has at best only a handful of staff officer who work

¹⁵⁴ Jerry M. Sollinger, "Improving US Theater Nuclear Doctrine: A Critical Analysis," *National Security Affairs Monograph Series*, No. 83-3, National Defense University, 1983, 6-7. At the time of the contractor study, the classified AFM 2-3 (1967), *Tactical Air Operations – Employment of Nuclear Weapons*, was over a decade old.

¹⁵⁵ Futrell, Vol II, 1989, 509.

¹⁵⁶ Ibid.

TNF, even on a part-time basis....
The situation at Tactical Air
Command and the overseas using
commands is no more promising.
On the positive side, there is a
USAF/Defense Nuclear Agency
cooperative effort that evaluates
various TNF issues under the aegis

*Within the fighter
community itself, the
tactical nuclear mission
was largely spurned
by a culture that prized
air-to-air combat.*

of a joint steering group. This group has sponsored several significant studies, accomplished mostly by civilian contractors. Those efforts, however, have not yet served to stimulate Air Force action.

...perhaps the root cause of those deficiencies is an apparently lukewarm attitude on the part of the fighter community toward TNF in general and the nuclear alert in particular. The TNF mission...lacks the esoteric elegance of modern air-to-air or air-to-ground combat and suffers proportionately in status and priority.¹⁵⁷

The author proposed formation of a focus group within the Air Force led by a general officer to study TNF and propose new initiatives: “the need is for a ‘road map’ for the USAF TNF posture, not for a detailed solution to all problems. ...it seems clear that it is in the interest of the Air Force to ensure that the TNF posture is a result of deliberate and careful planning rather than benign neglect.”¹⁵⁸

The article provoked a response from two other Air Force lieutenant colonels, both fighter pilots, that added more depth to the issue: “Put simply, our view is that the malaise surrounding theater nuclear force

¹⁵⁷ Lieutenant Colonel Richard L. Hodgkinson, “USAF and Theater Nuclear Warfare: A Proposal,” *Air University Review* 32, no. 6 (September-October 1981): 89-91.

¹⁵⁸ *Ibid.*, 93.

(TNF) is so widespread and of such a pervasive character that formation of a group in the Air Staff, even if headed by a general office, will do little to correct the situation.”¹⁵⁹ This was because:

...neither NATO nor the United States has thought through and agreed-on “how to fight” a tactical nuclear war; albeit we have written numerous concepts, we have not translated these concepts into operational doctrine. In short, the doctrine on which a war-fighting strategy to achieve political goals can be built does not exist and neither does a strategy. Do not misunderstand, war plans exist, but the answers of strategy, of use under what conditions and to achieve what political purpose do not.¹⁶⁰

The officers were keen to limit Air Force responsibility in this regard:

...the Air Force enters the TNF arena not by any bureaucratically mandated authority for nuclear affairs but rather under the purview of our nuclear tactical air power (TACAIR) missions and responsibilities as assigned by higher authority: primarily in the missions [sic] areas of counterair, interdiction, offensive air support and reconnaissance. No military service has been assigned a primary responsibility for conducting tactical nuclear warfare... tactical nuclear warfare is fought by combatant commanders, none of whom are directly under the command of the Department of the

¹⁵⁹ Lieutenant Colonel Donald J. Alberts, USAF, and Lieutenant Colonel Thomas Cardwell, USAF, “A Response,” *Air University Review* 32, no. 6 (September-October 1981): 93. ¹⁶¹ Ibid., 94. Technically speaking, such operational doctrine did exist within NATO. See “SHAPE Report on ACE Nuclear Operational Concepts and Doctrine,” NATO Nuclear Planning Group, 7 June 1973, NATO Declassified/Publicly Disclosed. However, that doctrine governing air operations consisted of two paragraphs, the first of which called for all strike aircraft committed to Allied Command Europe to be dual-capable. The second paragraph acknowledged the primacy of counter air operations but called for tactical nuclear capability also to be available in direct support of NATO ground forces. It further acknowledged constraints on NATO air operations, including the need to withhold aircraft for selective or general nuclear strikes. As such, this operational doctrine seemed to lack the specificity or depth that operators such as the Lieutenant Colonels were seeking in the early 1980s.

¹⁶⁰ Freed, *op. cit.*, 64.

¹⁶¹ Alberts and Cardwell, *op. cit.*, 93. ¹⁶² Ibid., 96.

Air Force...In short, there is no such thing as ‘Air Force TNF.’ While it is the Air Staff’s job to organize, train, and equip [forces for the combatant commanders], the latter bear responsibility for articulating the requirements to best solve the problems of battlefield dynamics in their theater of operations against the enemy they will face. The Air Staff must, of course, ensure that the overall doctrine for this war-fighting capability exists, and hopefully, the Air Staff would also contribute to the creation and formulation of war-fighting strategies. To do less would be a dereliction of professional responsibility.¹⁶²

In the footnotes, the officer noted that the Air Force had recently published AFM 1-5 (1979), *Theater Nuclear Doctrine* and that “...one of our major commands has been tasked to produce operational doctrine for tactical nuclear warfare but has so far been unable to come to grips with an overall concept. One reason we have not produced the concept is that such a concept must be, by its very nature, tied to the political symbology – and that task may be beyond the purview of the Air Force as a single service.”¹⁶³ The implied sense of helplessness here speaks to the depth of the TNF malaise, which afflicted not just the Air Staff but the regional combatant commanders and civilian overseers alike. None seemed willing to unpack the complexity of nuclear use at the theater level, particularly given the uncertainty that political authorization to undertake it would be forthcoming. This reluctance effectively ceded the operational initiative to the Soviet Union, which had less qualms and therefore a more coherent concept in this regard (see Chapter Four).

Consonant with the rise of the fighter generals, the Air Force, particularly TAC, was more attuned to developments in *Army* doctrine in the mid-1970s. At this time, the Army was rethinking its approach to halting a Soviet ground offensive in Europe and concluded that more concerted air attacks against the Soviet second echelon would be needed so that NATO ground forces could resist the first echelon. What emerged was the Army’s

¹⁶² Ibid., 96.

¹⁶³ Ibid., 97, n. 12.

concept of AirLand Battle, extending the battlefield deeper to attack enemy reinforcements with air power. AirLand Battle had been developed with Air Force participation via a joint Army-Air Force Studies Group that was created at Nellis Air Force Base in June 1975. In May 1979, this joint studies group was assigned a Joint Second Echelon Interdiction (J-SEI) study. Two years later, the J-SEI study was expanded to include tactical nuclear and chemical weapons, offering the prospect of a more integrated approach to theater planning.¹⁶⁴ What emerged in 1982 was a re-writing of Army doctrine, Field Manual (FM) 100-5, *Operations*. FM 100-5 (1982) indeed offered a more integrated view of the battlefield and identified a number of “preferred targets” for nuclear use, such as “follow-on or deep echelon forces,” all in support of the new “deep battle.”¹⁶⁵ In many respects, AirLand Battle and Air Force interest therein was a modern manifestation of General Weyland’s support to General Patton’s dash across northwest Europe in World War II.¹⁶⁶ Air Force doctrine at this time continued to emphasize the primacy of air power and the air superiority mission, but cooperative arrangements were made with the Army to improve coordination of air interdiction missions.¹⁶⁷

Critical to the Air Force contribution to AirLand Battle was the survivability of USAFE air bases, which remained a concern into the 1980s. Those concerns stemmed from base vulnerabilities to chemical or even conventional attack by the Warsaw Pact, which could suppress sortie generation. Nuclear attack recovery was not part of the discussion, *per se*, but presumably would benefit from measures taken to reduce vulnerabilities in the other two areas.

¹⁶⁴ Robert J. Hamilton, *Green and Blue in the Wild Blue: An Examination of the Evolution of Army and Air Force Airpower Thinking and Doctrine Since the Vietnam War* (Maxwell Air Force Base, AL: Air University Press, 1993), 31-32.

¹⁶⁵ United States Army, Field Manual (FM) 100-5, *Operations*, August 1982, 7-12.

¹⁶⁶ Danskin, *op. cit.*, 22.

¹⁶⁷ David E. Johnson, “Shared Problems: The Lessons of AirLand Battle and the 31 Initiatives for Multi-Domain Battle,” *Perspective*, RAND, 2018, <https://www.rand.org/pubs/perspectives/PE301.html>.

While the Air Force gave greater priority to theater air operations, concerns about the resiliency of USAFE bases to Soviet attack remained. In part, this was because survivability had no natural constituency.

USAFE initiated a number of remediation efforts in this regard. It established a base recovery after attack concept (BRAAT) to combine all key agencies under a single base director. To reduce its reliance on paved runways, it prepared alternate contingency runways

and taxiways. USAFE also developed a prototype underground fuel pipeline to connect aircraft shelters with fuel storage tanks and began installing in-shelter storage racks for air-to-air missiles. Cubicles were also installed in aircraft shelters to protect crew during briefin and rest periods. Munitions were dispersed and protective facilities were built for spare parts and engines. All of these measures would reduce the amount of time aircraft and crews had to be exposed on the tarmac.¹⁶⁸

Whereas USAFE previously practiced chemical warfare (CW) defense techniques for only a few hours during a five-day training exercise, it began to require all bases to generate sorties in a simulated chemical environment for six hours or more at a time. Chemically protected facilities for squadron operations were built at several USAFE bases and programmed for other bases. Complementing these initiatives, the Air Force created the Survivability Systems Management Office as a focal point to develop air base survivability solutions.¹⁶⁹

Much work remained, however. Realistic remedies to runway cratering and time-consuming repairs were not on the horizon. A complete in-shelter turn-around for aircraft was not likely to be fully implemented for years, if at all. Construction of additional facilities to protect spares was slow and expensive. Quick and accurate detection and identification

¹⁶⁸ Information in this paragraph comes from Major Stephen C. Hall, USAF, "Air Base Survivability in Europe: Can USAFE Survive and Fight?" *Air University Review* 33, no. 6 (September-October 1982): 43-44.

¹⁶⁹ *Ibid.*, 44-45.

of chemical agents remained a pacing issue, while decontamination of aircraft and ground support vehicles was painfully slow, limited by existing equipment, and lacking a well-developed plan. As an Air Force officer noted, “For too long, survivability has been a catch-as-catch-can proposition...the Air Force must press hard for survivability funding, and this is easier said than done. Survivability is not glamorous...[it] enjoys no natural constituency and thus competes at a disadvantage for scarce dollars.”¹⁷⁰



Figure 14: Test launch of the GLCM. Photo credit: U.S. Air Force.

The major theater force posture development during this phase was Air Force deployment of a new GLCM, the Gryphon. The Air Force’s first cruise missile, the Matador, was phased out in 1960, superseded by the Mace. Each missile played a key role in standing nuclear alert. In Air Force terminology, “Victor Alert” was the highest level of theater nuclear readiness. For cruise missiles, it meant the weapon was brought to the absolute minimum time to fire raised on its launch rails. For aircraft, it

meant a fully fueled and nuclear-armed fighter with a pilot in the cockpit, waiting for the order to start his engine.¹⁷¹ Quick Reaction Alert (QRA) was a little less demanding timewise than Victor Alert. QRA encompassed

¹⁷⁰ Ibid., 45-46.

¹⁷¹ George Mindling and Robert Bolton, *U.S. Air Force Tactical Missiles, 1949-1969: The Pioneers* (Morrisville, NC: Lulu.com Publishing, 2011), 154.

aircraft but also missiles that would disperse to field locations. While the two terms were distinct in Air Force usage, they were often conflated outside the service.¹⁷² Matador and Mace stood both kinds of nuclear alert in their day. Mace was removed from QRA following a 1965 decision by Secretary McNamara to re-assign the mission to the Army's Pershing I missile, which was more mobile and had a much shorter launch time.¹⁷³ In April 1969, the Air Force deactivated the last of its Mace units.

As noted, in the mid-1970s, there was a push by OSD and the Air Force to free up aircraft for conventional missions. This entailed putting more of the nuclear QRA burden on missiles, including Navy SLBMs.¹⁷⁴ At the same time, European NATO members were becoming increasingly concerned about the buildup of Soviet SS-20 IRBMs (which represented a significant capability upgrade, in terms of both readiness and accuracy, over its predecessors), and their impact on the theater nuclear balance. Against this backdrop, Air Force Chief of Staff General David Jones in 1977 included funding in the Air Force budget to begin development work on a new cruise missile. Looking to keep down its costs, the Air Force declined an offer from the Army to pick up the successor program to its Pershing I ballistic missile and instead opted to develop a land-based version of the Navy's Tomahawk cruise missile, the Gryphon. Additional demand for a new cruise missile came from TAC, which was in urgent need of a conventionally-armed stand-off weapon to suppress enemy air defenses.¹⁷⁵ In 1979, NATO approved a dual-track policy whereby certain European allies would agree to host the Army's Pershing II and the Air Force's GLCM, while the United States simultaneously undertook negotiations with the Soviets to limit theater nuclear forces. The United States also agreed to withdraw 1,000 obsolete nuclear warheads from

¹⁷² See Rebecca Grant, "Victor Alert," *Air Force Magazine*, March 1, 2011.

¹⁷³ Lieutenant Colonel Randall L. Lanning, USAF, United States Air Force Ground Launched Cruise Missiles: A Study in Technology, Concepts, and Deterrence, *Air War College Research Report*, Air University, United States Air Force, Maxwell Air Force Base, Alabama, 1992, 26.

¹⁷⁴ Futrell notes that USAF Chief of Staff "General Jones conceived that the GLCM...would take over the QRA nuclear alerts from tactical fighters and free them to fight conventional..." *Op. cit.*, Vol II, 1989, 512. See also John W. Finney, "Schlesinger Set to Cut Atom Arms," *New York Times*, April 25, 1974. See also Schlesinger, *op. cit.*, C-10.

¹⁷⁵ Information in this paragraph is drawn from Futrell, *Vol II*, 1989, 512.

Europe. A further 572 warheads would be withdrawn to compensate for the new Pershing II and GLCM warheads that would be arriving. As with ballistic missiles previously, the Air Staff was ambivalent about the Gryphon. General Lew Allen, the new CSAF, inherited the program and its unforeseen cost overruns, yet was unable to abandon it due to the NATO commitment. Lieutenant General Kelly Burke, Deputy Chief of Staff for Research, Development, and Acquisition, argued in 1981 that tactical aircraft like the F-111 were more than capable of continuing the QRA mission and were more cost-effective than GLCM because of their dual-capability.¹⁷⁶ As one Air University study noted, “Except in Tactical Air Command, which had the tactical nuclear mission, USAF demonstrated very little interest in this weapon.”¹⁷⁷ Indeed, “An air force general stated that the USAF ‘didn’t want the GLCM, we were issued it.’”¹⁷⁸

Nonetheless, the Air Force met its deployment schedule, and its first GLCM unit became operational at the Royal Air Force (RAF) base at Greenham Common, UK in December 1983. Deployment to the Florennes air base in Belgium followed the next year and at Italy’s Comiso air base in 1985. In March 1986, another Air Force GLCM unit became operational at Wiesbaden air base in West Germany. Fulfilling the vision of OSD, General Jones, and others in shifting the theater nuclear burden to missiles, the Air Force’s 20th Fighter Wing, which deployed the first nuclear-capable F-84s to England in 1952, came off QRA in November 1986.¹⁷⁹

The basic operating unit for the Gryphon was the flight consisting of four transporter-erector-launchers, carrying four missiles each, and two mobile launch control centers (LCCs). Only one LCC was needed to fire the missiles; the other was a backup. The LCCs were equipped with

¹⁷⁶ Ibid., 515.

¹⁷⁷ Kenneth P. Werrell, *The Evolution of the Cruise Missile* (Maxwell Air Force Base, AL: Air University Press, September 1985), 204.

¹⁷⁸ Kenneth P. Werrell, “The Weapon the Military Did Not Want: The Modern Strategic Cruise Missile,” *The Journal of Military History* 53, no. 4 (October 1989): 431.

¹⁷⁹ Airman 1st Class Kelsey Tucker, USAF, “30 Years Past: 20th FW Role in Victor Alert,” Shaw Air Force Base, November 18, 2016, <https://www.shaw.af.mil/News/Features/Display/Article/1008455/30-years-past-20th-fw-role-in-victor-alert/>.

radios to receive emergency action messages directing employment of the nuclear-armed missiles.¹⁸⁰ USAFE assembled a team of SAC missile officers to develop the command, control, communications, and operational procedures that would blend GLCM into existing U.S./NATO nuclear systems. The USAFE team realized that no protection against electro-magnetic pulse (EMP) was being planned for the system, which had to be added for \$12.6 million (against total hardware costs of about \$1 billion).¹⁸¹ The Air Force then tasked SAC to staff the GLCM units, given the Command's missile expertise:

When the flight was out in the field it essentially performed as a ground based tactical unit. Much of the training overlapped with what was provided for the Army. This was [a] unique experience for many of the launch officers as the ones who transitioned from ICBMs were used to fixed alert facilities and not carrying a[n] M-16 rifle around.¹⁸²

Like the Army's Pershing II missiles, the GLCMs were under the command of SACEUR, who also served as the Commander in Chief of U.S. European Command (CINCUSEUCOM). Nuclear release thus would flow from the U.S. National Command Authorities to SACEUR/CINCUSEUCOM, and nuclear employment orders would proceed from there in parallel down NATO and U.S. national command chains to the GLCM LCCs.¹⁸³ In the event of war, USEUCOM would split into two elements, one with U.S. national responsibilities based in England at USEUCOM's wartime headquarters,¹⁸⁴ and the other with

¹⁸⁰ Lanning, *op. cit.*, 36-39.

¹⁸¹ Colonel (Ret.) Jim Slagle, "GLCM Before There Were Bases," *Air Force Missileers* 28, no. 2 (June 2020): 11. See also Colonel (Ret.) Charlie Simpson, "GLCM – A New World for Missileers," *Air Force Missileers* 28, no. 2 (June 2020): 6.

¹⁸² Hui-Jen Shaiu, "The Last GLCM Alert," *Air Force Missileers* 28, no. 2 (June 2020): 13.

¹⁸³ Bruce G. Blair, "Alerting in Crisis and Conventional War," in Ashton B. Carter, John D. Steinbruner, and Charles A. Zraket, *Managing Nuclear Operations* (Washington, DC: The Brookings Institution, 1987), 112.

¹⁸⁴ *Ibid.*, 98.

NATO responsibilities at SACEUR's wartime bunker in Belgium. Theater mission planning and targeting for GLCMs was USEUCOM's responsibility and would similarly be split; that for UK-based GLCMs would be performed by the USEUCOM wartime headquarters. Given the ability of GLCM (and Pershing II) to reach deep into the Soviet Union, its targeting under SACEUR's General (i.e., nuclear) Strike Plan (later called the Nuclear Operations Plan) reportedly required new rules for coordination with the U.S. Single Integrated Operations Plan for strategic nuclear warfare.¹⁸⁵ A portion of the GLCM force was kept on QRA, and SACEUR had the authority to increase that alert level with or without the approval of NATO allies.¹⁸⁶

In December 1987, a GLCM unit became operational at RAF Molesworth before the second track of the NATO approach bore fruit in the form of the INF Treaty. Under the treaty, deployment of GLCMs was frozen at 304 missiles, meaning that the Netherlands managed not to receive its allotment. Thereafter, all of the GLCMs, as well as the U.S. Army's Pershing II missiles, the West German Army's Pershing I missiles, and the Soviet Union's SS-4, SS-5, and SS-20 missiles would be eliminated under U.S. and Soviet supervision. By the treaty's deadline of 1 June 1991, all of these missiles, launcher systems, and transporters were destroyed.

After the Berlin Wall fell in November 1989, signaling the collapse of communism in Eastern Europe, President George H.W. Bush announced the following May cancellation of plans to modernize NATO's tactical nuclear weapons. He also called for a NATO summit to agree on objectives for future negotiations between the United States and the USSR on short-range nuclear missiles in Europe. In September 1991, under his Presidential Nuclear Initiative (PNI), Bush went further and announced that all U.S. ground-launched tactical nuclear weapons would be removed from Europe and destroyed, along with those in storage in the United States. All nuclear weapons would be removed from U.S. surface ships, attack submarines, and land-based naval aircraft and destroyed, while a

¹⁸⁵ Catherine McArdle Kellher, "NATO Nuclear Operations," in Carter, Steinbruner, and Zraket, *op. cit.*, 450.

¹⁸⁶ Blair, *op. cit.*, 91-103.

portion of Tomahawk cruise missiles would be kept in storage. The impact of this Presidential Nuclear Initiative was initially minimal on the Air Force's theater nuclear capability – the SRAM-T air-to-surface missile was cancelled. However, the following month NATO's Nuclear Planning Group announced the Alliance also would be greatly reducing – but not eliminating – U.S. nuclear gravity bombs based in Europe, reportedly from 1,400 to 700.¹⁸⁷

With the collapse of the Soviet Union itself in December 1991, NATO continued to scale back its theater nuclear posture. The USAF and certain European NATO members continued to operate dual-capable DCA but within a smaller footprint of bases and weapons storage facilities. Before long, QRA was discontinued for these aircraft, and their readiness was measured not in minutes but hours and days.¹⁸⁸ USAFE continued to train for nuclear missions but Air Force enthusiasm for the DCA mission waned as the 1990s progressed.¹⁸⁹

Assessing the Air Force's Cold War Approach to Nuclear-Conventional Synchronization

Across these three phases spanning the mid-1940s to early-1990s, what did the Air Force manage to accomplish in terms of nuclear and conventional synchronization? What gaps remained as the Cold War ended?

¹⁸⁷ In contrast, the PNIs had major implications for USAF strategic nuclear systems. See Susan J. Koch, "The Presidential Nuclear Initiatives of 1991-1992," *Case Study Series 5*, Center for the Study of Weapons of Mass Destruction, National Defense University, September 2012.

¹⁸⁸ "NATO's Nuclear Forces in the New Security Environment," *NATO Nuclear Fact Sheets*, June 4, 2004. Available at <http://www.acronym.org.uk/old/archive/docs/0406/doc16.htm>.

¹⁸⁹ Jeffrey A. Larsen, "The Future of U.S. Non-Strategic Nuclear Weapons and Implications for NATO," NATO Public Policy Division, 31 October 2006, 44.

Nuclear-Conventional Synchronization Accomplishments

Compared to the Army and Navy, the Air Force was uniquely suited, in terms of doctrine and force structure, to integrate nuclear weapons into its conventional force posture and had the easiest time of it. Unlike the Army, the Air Force did not alter its basic structure, as there was no need to, given its dogmatic approach to strategic bombing and initial possession of the only delivery system capable of carrying the early atomic bombs. Under the exigencies of war, the Air Force explored various opportunities to bring its nuclear capability to bear in Korea. Technical and operational limitations of the time rendered planning for nuclear employment on or near the battlefield impractical. Instead, the Air Force looked to knock Soviet and Chinese air forces out of an expanded war by dropping A-bombs on their air bases, consistent with its airpower theory. This geographical division of labor, whereby the close-in battle would be fought by conventional land-sea-air forces while critical military targets in the rear would be struck with atomic bombs, amounted to a proto-joint doctrine for nuclear-conventional synchronization. Even if not recognized as such at the time, this joint synchronization “doctrine” would be short-lived, as tactical nuclear weapons and delivery systems were soon deployed widely by each of the services. Regardless, the prominent role the Air Force enjoyed in nuclear planning during the Korean War, abetted by the transfer of fully operational atomic bombs to the military, solidified Air Force interest in nuclear warfare. Indeed, the Air Force was so successful at integrating nuclear weapons that it approached sole reliance on them by the late 1950s.

Early on, the Air Force was abetted in its drive for nuclear exclusivity by the economy-minded Eisenhower Administration, which generally accepted the service’s ideas about the centrality of nuclear weapons and was determined to pursue cost savings through cutting conventional forces.¹⁹⁰ By laying claim to the strategic nuclear mission, the Air Force was eager to set aside its supporting role to the Army and Navy and thereby protect its cherished autonomy. This was a victory for parochialism, however, not joint warfare. The Air Force and the overall

¹⁹⁰ Lemmer, *op. cit.*, 73.

war effort would pay dearly for this nuclear fixation in Vietnam. It would also be the undoing of the bomber generals, who had controlled the Air Force since independence in 1947.

Having committed itself to a strategic nuclear striking force in being, the Air Force honed SAC into a war machine of unprecedented destructive power. Faced with America's traditional rapid demobilization following a war, SAC moved from a rudimentary outfit of a few war-surplus bombers, most of which were not even capable of carrying atomic bombs, to a peak of 1,800 nuclear-armed jet bombers in 1960.

SAC was given every priority within the Air Force institution and culture. Curtis LeMay held the Command to the most exacting standards. In 1960, SAC achieved its goal of maintaining 30 percent of the bomber force ready to launch on 15-minutes' notice, and attained 50 percent readiness the following year.¹⁹¹ This is a tremendous accomplishment in terms of leadership, discipline, training, and operational readiness, although not without significant risks¹⁹²

The strategic superiority provided by SAC during the Cuban Missile Crisis is seen by many, and certainly by Air Force leadership at the time, as the main reason the Soviet Union backed down. As SAC veteran Major General (Ret.) Catton put it:

The concept of strength was absolutely proved, and dramatically, during the Cuban Missile Crisis, when we had absolute superiority.

¹⁹¹ Office of the Historian, Headquarters Strategic Air Command, Offutt Air Force Base, *Alert Operations and the Strategic Air Command, 1957-1991*, 7 December 1991, 4, 13.

¹⁹² At such a high operational tempo and with a portion of the force flying airborne alert, there were inevitable nuclear mishaps. In particular, SAC bombers with nuclear weapons on board crashed – in Greensboro, North Carolina (1961), Spain (1966), and Greenland (1968). No nuclear explosions resulted, but massive clean-up efforts were required with the latter two due to radioactive contamination of the crash sites. SAC's airborne alert posture was ended shortly after the Greenland crash. SAC's bomber force completely came off nuclear alert and nuclear weapons were removed from the aircraft in September 1991 under the PNI. *Ibid.*, 24, 48-49.

Khrushchev was looking down the largest barrel he had ever stared at, once Strategic Air Command did in fact generate its forces.... The Russians had no alternative but to step down and do what they were asked to do. End of speech.¹⁹³

In the mid-1960s, the Air Force rediscovered the importance of *balanced* nuclear and conventional capability. This was a problem of its own making, however. The Air Force's near exclusive focus on nuclear weapons left it unprepared for air-to-air combat and conventional bombing. The service also lacked enough pilots and conventional munitions for *sustained* air operations. This re-education was costly in terms of casualties and aircraft losses in Vietnam, but those hard lessons laid the foundation for critical Air Force advances in ECM, CAS, and precision targeting that endure to this day. The growth of the ICBM force enabled the Air Force to devote half of its strategic nuclear bombers to conventional missions in Vietnam. This was an important but *ad hoc* form of *intra-service* nuclear-conventional synchronization.

Stung, in part, by the Vietnam experience, the Air Force belatedly accepted the premise of Flexible Response. This manifested in efforts to free-up fighter for conventional missions by shifting more of the nuclear QRA burden to missiles. While the details are lacking in the open sources, it seems the Navy's allocation of additional SLBM warheads to NATO in the 1970s helped free up some USAF aircraft for conventional missions, a form of *inter-service* nuclear-conventional synchronization. In time, the Air Force helped shift that burden further by deploying a new generation of GLCMs in the early-1980s, albeit reluctantly, as the cruise missile remained at odds with the piloted aircraft culture.

With the rise of the "fighter generals" after Vietnam, the Air Force paid greater heed to close air support of the Army and participated in the development of the AirLand Battle concept, which gave new impetus to the air interdiction mission against Warsaw Pact second-echelon ground

¹⁹³ Ibid.

forces. As part of this shift in thinking, the Air Force began to improve the resiliency of USAFE air bases in Europe against conventional and chemical attack.

Remaining Gaps in Nuclear-Conventional Synchronization

As indicated, the tale of Air Force nuclear-conventional synchronization during the Cold War is largely one of overcoming the service's fixation with nuclear weapons. The cultural shift begun in the early 1970s from the "bomber generals" to the "fighter generals" was important in this regard,¹⁹⁴ but major gaps remained at the end of the Cold War. Within the fighter community itself, the tactical nuclear mission was largely spurned by a culture that prized air-to-air combat. As with the Army and Navy, the Air Force lacked doctrine for how to prevail in mixed nuclear and conventional combat at the theater level. This doctrinal gap was lamented by Air Force officer and other experts from the 1970s through the 1980s.

There are many reasons for this gap. To begin, the Air Force struggled for decades to devise its basic doctrine, with competing institutions and shifting authorities. It also kept its nuclear-related doctrine from public view, which stifled discussion and accountability. As noted, some Air Force officer attributed the gap to the geographic combatant commanders and the lack of joint doctrine, an argument with some merit that also tended to overlook the Air Force's responsibility in contributing to joint doctrine. Above all, it is apparent that for most of the Cold War, Air Force leadership considered strategic nuclear warfare to be "the main event." In its view, a direct conflict with the Soviet Union could only escalate rapidly to all-out nuclear war. SAC was honed specifically for that purpose, postured to unleash in a single spasm the many thousands of nuclear weapons at its disposal. Against this backdrop, there was little incentive in undertaking the complex thinking needed to develop a workable concept of nuclear and conventional force synchronization at the theater level.

¹⁹⁴ For a retrospective, see Danskin, *op. cit.*, 15-22.

During the Vietnam conflict the Air Force had great difficulty balancing nuclear and conventional missions within the bomber leg of the U.S. triad. As noted, B-52 pilots and crews were overstretched and nuclear readiness was significantly degraded. While the service was able to load-shift strategic nuclear deterrence to its ICBM force, it is clear that Air Force leadership had underestimated the demands of sustained conventional operations on the bomber nuclear deterrence mission.

While the new leadership of the Air Force in the 1970s gave greater priority to theater air operations, concerns about the resiliency of USAFE bases to Soviet attack remained. In part, this was because survivability had no natural constituency within the Air Force, and spending on fixed installations came at the expense of cutting-edge aircraft, which is the natural preference of “fighter generals.” By the late-1970s, a number of Air Force leaders were looking to free all fighters from the nuclear TACAIR mission. This suggested a wide swing of the pendulum in the opposite direction, rather than a balanced, synchronized approach to conventional and nuclear weapons. While the Air Force carried on a much-contracted DCA mission in NATO following the 1991 PNI, it did so with rapidly waning enthusiasm and no further effort to articulate a workable theater nuclear doctrine.

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CHAPTER FOUR: The Soviet Union's Approach to the Synchronization of Nuclear and Conventional Weapons During the Cold War

The following analysis reviews Soviet military doctrine from 1950 to 1991 with a focus on the evolving relationship between conventional and nuclear forces. Successive Soviet doctrines can be characterized by how the Soviet military understood and adapted to the changing nature of modern warfare, and the implications for the dynamic between conventional and nuclear forces. Using primary Soviet sources, declassified U.S. intelligence documents, and authoritative academic observations, at least four distinct periods can be identified

1. Grappling with the advent of nuclear weapons (1950s)
2. Embrace of the nuclear revolution (early 1960s)
3. Consideration of conventional-only and limited nuclear combat (mid 1960s-mid 1970s)
4. Pinnacle and decline of nuclear-conventional synchronization (mid 1970s-early 1990s)

Each phase exhibited its own unique vision that in turn helped formulate the appropriate balance between conventional and nuclear forces. To be sure, military thought in the Soviet Union was energetic and often outpaced doctrinal developments. Thus, concepts did not always neatly align with the official doctrine of the time. The partitions recognized in this section are merely an organizational tool for categorization purposes.

It is important to understand what doctrine entailed within the Soviet system. In the USSR, military doctrine was carefully defined and promulgated by the political leadership under the Central Committee of the Communist Party. It provided guidance to the military and identified the nature of warfare, the preparations to be undertaken, and the priority tasks and problems. In contrast, U.S. military doctrine is a very flexible term that includes national doctrine, allied doctrine, and service and joint doctrine, among others. U.S. doctrine equated more evenly with Soviet

principles of operational art or tactics, which were at the base of Soviet military thought.¹ For the Soviets, doctrine was the apex.

1. Grappling with the Advent of Nuclear Weapons (1950s)

Following the conclusion of World War II, the Soviet Union sought to prepare for a future global conflict that might feature atomic weapons. This generated significant deliberation within the Soviet political elite regarding the meaning and value of nuclear weapons. For example, Joseph Stalin reportedly believed “Hiroshima has shaken the whole world. The balance [among major powers] has been destroyed.”² Others expressed optimism in the political function of nuclear weapons as a deterrent to large-scale attack.³ These conversations, though closely held, became more acute after the Soviet Union detonated its first atomic bomb in 1949 (see Figure 15) and started to grow a nuclear weapons stockpile.

In the meantime, the Soviet military required political guidance on how to address the mounting potential for conflict with the West. Soviet armed forces continued to prioritize World War II-era tactics and methods for combat. Nuclear weapons, while important, were not considered decisive by most senior military officers. By contrast, Marshal Georgy Zhukov, hero of the battles of Kursk and Berlin, urged Stalin to develop a new military doctrine where nuclear weapons were used tactically in conjunction with ground forces.⁴ Stalin was suspicious of Zhukov politically, however, and feared that America’s technological superiority would give it an advantage in a nuclear arms race.⁵ Stalin also could not jeopardize his wartime legacy. Thus, he and other Soviet leaders publicly

¹ Joseph D. Douglass, Jr., *The Soviet Theater Nuclear Offensive*, Office of Defense Research and Engineering, Defense Nuclear Agency, 1976.

² David Holloway, *Stalin and the Bomb* (New Haven, CT: Yale University Press, 1994).

³ Vladislav M. Zubok, “Stalin and the Nuclear Age,” in John Gaddis, Philip Gordon, Ernest May, and Jonathan Rosenberg eds., *Cold War Statesmen Confront the Bomb: Nuclear Diplomacy Since 1945* (Oxford, UK: Oxford University Press, 1999), 39-61.

⁴ Owen Matthews, “Russian Roulette: What ‘Tactical’ Nuclear War Would Mean,” *The Spectator*, November 14, 2022, <https://spectatorworld.com/topic/russian-roulette-tactical-nuclear-war/>.

⁵ Ibid.



Figure 15: The USSR detonates its first atomic bomb on Aug. 29, 1949 at the Semipalatinsk Test Site, in Kazakhstan. Photo credit: PBS.

disparaged the relative significance of new technology compared to the “Permanently Operating Factors” that they claimed had proven decisive in defeating Nazi Germany.⁶ Western reliance on nuclear weapons was pronounced as misguided.

The resulting prominence of combined-arms operations by conventional forces was a strategic necessity in that it was not until the mid-1950s that deliverable nuclear weapons were actually fielded by the Soviet military. By this time, the United States had begun to rapidly deploy large quantities of nuclear weapons that included tactical systems in Western Europe. Nonetheless, Stalin held to his view that the Soviet military should not develop detailed offensive nuclear war plans but rather rely on its primary strategic advantage relative to the United States – the massive conventional might of the Red Army.⁷

Following the death of Stalin in 1953, Soviet military writers had relatively more freedom and began to address nuclear forces, though conventional forces remained paramount. Nuclear weapons were treated simply as a more powerful armament to be absorbed into established methods of war. While nuclear weapons could exert significant influence

⁶ Stalin’s Permanently Operating Factors were: stability of the rear, morale of the army, quantity and quality of divisions, equipment of the army, and organizing ability of the commanding personnel of the army. Paul Schulte, “Tactical Nuclear Weapons in NATO and Beyond: A Historical and Thematic Examination,” in Tom Nichols, Douglas Stuart, and Jeffery D. McCausland eds., *Tactical Nuclear Weapons and NATO* (Carlisle, PA: U.S. Army Strategic Studies Institute, U.S. Army War College, 2012), 20.

⁷ Vojtech Mastny, “Imagining War in Europe,” in Vojtech Mastny, Sven G. Holtsmark, and Andreas Wenger eds., *War Plans and Alliances in the Cold War: Threat Perceptions in the East and West* (London, UK: Routledge, 2006), 250-251.

on the course of a war, Soviet planning remained steadfast that they would not decisively affect the outcome.⁸ As noted by then-Major-General G. Pokrovsky, “Atomic and thermonuclear weapons at their present stage of development only supplement the firepower of the old forms of armament.”⁹ In other words, nuclear weapons were principally intended to improve the firepower capacity of the ground forces.¹⁰

Having aligned with Nikita Khrushchev in his bid to succeed Stalin, Zhukov was appointed Deputy Minister of Defense, where he was able to advance his notion of synchronized nuclear-conventional combat:¹¹

[I]n September 1954, 18 months after Stalin’s death, Zhukov finally got his wish. A 40 kiloton bomb known as RDS-4 – twice as large as the Hiroshima device – was detonated over the remote steppe near Totskoye in the southern Urals. Thirteen kilometres from ground zero, 45,000 Soviet troops, plus about 1,200 tanks and armored personnel carriers, waited in battle order. The men had not been



Figure 16: Soviet anti-atomic defense unit demarcating radioactive zone around Totskoye nuclear blast, 1954. Photo credit: The Discovery Channel.

⁸ Edward L. Warner III, “Soviet Concepts and Capabilities for Limited Nuclear War: What We Know and How We Know It,” A RAND Note, February 1989, 9.

⁹ Honore M. Catudal, *Soviet Nuclear Strategy from Stalin to Gorbachev* (Atlantic Highlands, NJ: Humanities Press International, Inc., 1988), 44.

¹⁰ Major-General M. Goryainov, “Nuclear/Missile Armament and Some Principles of Military Doctrine,” *Military Thought*, December 18, 1961. Declassified by the CI on April 19, 2012.

¹¹ Reportedly, the Soviet military chose the Totskoye site because its topography was similar to West Germany and the Fulda Gap, through which a Warsaw Pact invasion would pass. According to a test witness, two fighters escorted the bomber carrying the atomic bomb in case the pilot refused to carry out the drop. This was particularly important since civilian inhabitants were nearby. See “Nuclear Explosion Witness,” *The People*, December 20, 2018 [In Russian], <https://www.youtube.com/watch?v=VUaayUycatI>.

issued with any protective gear. Five minutes after the detonation, fighter–bomber were sent over the blast site to drop conventional bombs. Three hours later the tanks were sent in, followed by the infantry. Zhukov observed from an underground nuclear bunker. Superficial medical examinations of the troops showed that marching into nuclear fallout was not immediately lethal, which was good enough for the Soviet commander. No systematic record was ever kept of the radiation poisoning and cancers that would later affect the men.¹²

From the outset, the Soviet approach to synchronization emphasized the psychological and morale aspects of nuclear war in troop training.

Other reports cite limited personnel protective equipment such as gas masks, shelters beginning five kilometers from the epicenter of the blast, and equipment for partial sanitary treatment and decontamination.¹³

This also included dosimetric equipment to determine the degree of contamination and water trucks to support decontamination efforts.¹⁴ However, it is unclear the degree to which those capabilities were actually employed. According to one account, the 115-degree temperatures prohibited donning of gas masks and protective gear during the intensive activities.¹⁵ Additionally, veterans explained at the end of the exercise that soldiers did not change their contaminated clothing or weapons. Rather, they were first interviewed by psychologists to test their morale.¹⁶ Guarding against psychological stress resultant from nuclear combat remained paramount in Soviet training until the end of the Cold War. Zhukov rose to Defense Minister the following year but soon fell out of Khrushchev's favor and was forced into retirement in 1957. Nonetheless,

¹² Matthews, *op. cit.* It is interesting to note that the Totskoye test came three years after the United States held its widely publicized Desert Rock tactical nuclear tests, which involved far less troops.

¹³ Meeting Held by Marshal of the Soviet Union Commander G.K. Zhukov, September 4, 1954 at Totskoye Camps. Woodrow Wilson Center, Digital Archive.

¹⁴ I. Petrov, "On Safety [During the Totskoye Nuclear Exercise]," Report, April 1954. Woodrow Wilson Center, Digital Archive.

¹⁵ Marlise Simons, "Soviet Atom Test Used Thousands As Guinea Pigs, Archives Show," *New York Times*, November 7, 1993.

¹⁶ Ibid.



Figure 17: Soviet tank moving through debris field soon after Totskoye nuclear detonation. The location was chosen because it resembled the Fulda Gap in West Germany. Photo credit: The Discovery Channel.

his vision of integrated nuclear-conventional combat first tested at Totskoye was a powerful legacy for the Red Army.

As part of his broader campaign of de-Stalinization, Khrushchev repudiated the Permanently Operating Factors and

embraced nuclear weapons, going even further than Zhukov. In 1959, he created the Strategic Rocket Forces as a new and pre-eminent branch of the Soviet military. Not unlike the Eisenhower Administration with its “New Look” in 1952, Khrushchev eyed atomic weapons as a means of cutting back large and expensive conventional forces. His drawdown of conventional forces alienated much of the Red Army’s leadership.

In terms of force posture, the Soviet nuclear capability was quite limited during this time. Until the introduction of the SS-3 medium-range ballistic missile (MRBM), nuclear weapons were to be delivered from strategic bombers. Due to the smallness of the Soviet nuclear stockpile and the poor accuracy of delivery systems, initial planning was confined to the destruction of Western Europe’s most important cities. Later, this target set expanded to include vital military targets within the theater of operations, though on a limited scale. The majority of targets would have to be destroyed by conventional means, as General of the Army Kurasov observed:¹⁷

Not too long ago, during our command-staff exercises, the front having a limited amount of nuclear ammunition, was able to deliver nuclear strikes only against the most important, individual targets and objectives of the enemy, while a substantial portion of other targets and objectives continued to be destroyed by conventional weapons. And if it is recalled that practically the only carrier of nuclear weapons at that time was aircraft, which often

¹⁷ Warner, *op. cit.*, 9.

did not reach the target, then one can even more fully understand the insufficient effectiveness of nuclear strikes of that period. In connection with the limited use of nuclear weapons in offensive operations of a front, the possibility of simultaneous destruction of enemy groupings and objectives in the entire depth of their operational formation was precluded during our exercises at that time. Therefore, the troop offensive, as in the past, was carried out through the successive overcoming of enemy resistance, during which the enemy had the opportunity to maneuver his forces and weapons from the rear and the flank for the creation of strike groupings.¹⁸

Even as atomic munitions and delivery vehicles slowly improved, only those targets deemed most important to operational and strategic success would be held at risk by nuclear forces. Otherwise, wasteful expenditure could cripple Soviet momentum, as explained by Chief Marshal of Artillery S. Varentsov:

In order to insure success in an offensive operation, when only a limited amount of nuclear warheads is available, it is necessary to exercise great care in selecting the objectives to be destroyed by nuclear weapons. They must truly be the most important objectives, the destruction of which will result in achieving fir superiority over the enemy, a sharp change in the relative strength of forces in our favor, the loss of control by the enemy, and, as a result, the creation of most favorable conditions for operations by tank, motorized infantry, and airborne large units and units in completing the total rout of the enemy.¹⁹

¹⁸ General of the Army V. Kurasov, "The Influence of Nuclear Weapons on the Principles of the Offensive Operations of a Front," *Military Thought*, No. 3, 1960. Declassified by the CI on January 6, 2012.

¹⁹ Chief Marshal of Artillery S. Varentsov, "Some Problems in Destroying Targets with Nuclear Warheads," *Military Thought*, No. 4, 1961. Declassified by the CI on January 13, 2012. Arguably, the same criteria might apply to the limited use of nuclear weapons by Russia in a regional conflict

Thus, atomic munitions would be applied in mass, supporting the main axis of conventional attack, in either single or grouped strikes. Mass nuclear strikes were usually delivered only at the beginning of the operation and with limited goals.²⁰ Driven by political constraints on doctrine, an institutionalized preference for traditional combined arms, and limited stocks of atomic weapons, the Soviet military slowly was coming to terms with the challenges of synchronizing nuclear and conventional operations, showing a clear bias that the former served the latter.

2. Embrace of the Nuclear Revolution (Early 1960s)

Following the post-Stalinist power shift in the mid-1950s, political and military elites were free to reevaluate the military role and value of nuclear weapons in Soviet military doctrine. In 1960, Nikita Khrushchev announced a radical departure in Soviet thinking at the fourth session of the Supreme Soviet. In his speech, he described nuclear weapons as unique and unprecedented weapons whose employment would be the sole determinant of victory. Indeed, the *initial* nuclear exchange would of itself decide the outcome of the conflict as a whole.

For Khrushchev, nuclear weapons transformed the nature of warfare. A future conflict between capitalism and communism – should it begin – would take place across the entire depth of warring coalitions' territory and involve the unrestricted employment of nuclear forces. As interpreted by the Soviet military, “every single large industrial or administrative center, every single strategic area, will be subject to attack not just during the first days, but during the first minutes of the war.”²¹ The rapid, mass introduction of strategic nuclear strikes by both sides thus would culminate in a short, sharp, and conclusive war. In Khrushchev's view, “any war involving the Soviet Union and the West would be a decisive

²⁰ Lieutenant Colonel Ye. Pavlov, “The Massed Use of Missile Troops in Operations,” *Military Thought*, No. 6, 1961. Declassified by the CIA on January 13, 2012.

²¹ Colonel-General A. Gastilovich, “The Theory of Military Art Needs Review,” *Military Thought*, No. 1, 1960. Declassified by the CIA on June 30, 1992.

global conflict between the superpowers, its outcome largely determined by massive U.S.-Soviet nuclear exchanges during the first hours. Strategic exchanges also would decide any European conflict.²²

Rather than a balanced nuclear-conventional force, Khrushchev envisioned a future Soviet military dominated by strategic nuclear weapons.

Khrushchev's contrast between nuclear and conventional forces was correspondingly drastic. He viewed the nuclear-armed intercontinental ballistic missile as an absolute weapon. This was affirmed

after the newly created Strategic Rocket Forces supplanted the Army as the preeminent service within the Soviet armed forces. Indeed, traditional conventional forces were consistently criticized by Khrushchev as obsolete and unnecessary.²³ Even nuclear weapons used by the ground forces (in Soviet parlance tactical and operational-tactical nuclear forces) were ascribed secondary importance. Rather than a balanced nuclear-conventional force, Khrushchev envisioned a future Soviet military dominated by strategic nuclear weapons. This logic reinforced Khrushchev's proposals to reduce conventional force expenditures and manpower.

Khrushchev's strategic guidance had mixed results. On one hand, the Soviet military accepted the decisive nature of nuclear weapons on the modern battlefield. As noted by Colonel-General A. Gastilovich:

The mass employment of nuclear/missile weapons promotes a more rapid attainment of operational goals than has been the case in the past. There is every reason to suppose that the duration of operations will be sharply curtailed. In any case, the protracted battles, lasting many days, which were characteristic of the Second World War

²² "Evolution of Soviet Concepts and Forces for Nuclear War in Europe," Intelligence Report, Central Intelligence Agency, November 1974, 5-6. Declassified by the CIA on June 18, 2012.

²³ "Khrushchev on Nuclear Strategy," Office of Current Intelligence, Central Intelligence Agency, January 19, 1960. Declassified by the CIA

have, we consider, become a thing of the past. According to the experience of a number of exercises, a front offensive operation will continue for an average of 8 to 10 calendar days.²⁴

Given the unique technical characteristics inherent to nuclear weapons, as well as the possibility of employing them in mass, Soviet military planners recognized strategic forces would be the main means to decide the conflict's outcome. In Gastilovich's view, "The great range of fire of missiles makes it possible to resolve the problem of fire maneuverability in a new and more successful way than formerly while conducting an operation. It is now possible to maneuver fire on a sufficiently broad scale and, thereby, quite effectively and quickly influence the course and outcome of combat operations."²⁵ Most Soviet military planners accepted, at least tepidly, that the introduction of mass nuclear strikes required revision of operational thinking. This required a bold, radical break so that the use of nuclear weapons became the military's primary foundation.²⁶

Not surprisingly, this generated intense debate over the necessity for continuing the development of traditional capabilities and concepts, namely large tank and infantry formations. Chief Marshal of the Armored Troops P. Rotmistrov maintained that tanks would remain critical to the modern battlefield.²⁷ This was echoed by other Ground Force commanders.²⁸ Conversely, Chief Marshal of Artillery S. Varentsov argued that tactical missiles could perform most battlefield tasks previously accomplished

²⁴ Gastilovich, *op. cit.*

²⁵ Ibid.

²⁶ Major-General I. Zav'yalov, "The Suitability of Modern Means and Methods in the Conduct of Operations," *Military Thought*, No. 1, 1962. Declassified by the CI on September 25, 2012.

²⁷ Chief Marshal of the Armored Troops P. Rotmistrov, "Modern Tanks and Nuclear Weapons: Military Survey," *Current Digest of the Soviet Press*, November 21, 1962, 20-21.

²⁸ For example, see Colonel V. Khoroshcho, "Soviet Defense Geared to Anti-Tank War: A Soviet View of the Impact of Missiles and Nuclear Weapons on Small Unit Defensive Tactics," Translated from *Krasnaya Zvezda*, December 12, 1961 in *Marine Corps Gazette*, August 1962, 13, and Colonel-General of the Tank Troops P. Poluboyarov, "Some Questions in the Further Development and Improvement of the Ground Troops," *Military Thought*, No. 3, 1961. Declassified by the CI on May 3, 2012.

by tanks and infantry.²⁹ For officers such as Varentsov, nuclear weapons had rendered it unnecessary to deploy a large number of divisions as was done in past wars.³⁰ This included challenging traditional elements of operational art considered to be outdated following the advent of nuclear warfare.³¹ Most of the military, however, believed that combined conventional arms remained essential even in the face of massed nuclear strikes. Indeed, *larger* conventional forces were necessary to overcome the anticipated effects of nuclear weapons, defeat remaining enemy forces, and protect the homeland from Western conventional and nuclear attacks.³²

A peculiarity of modern war consists of the fact that nuclear weapons are the decisive means of defeat. They are capable of destroying an enemy's military potential and his strategic means of fighting and of disorganizing military and government control as well as the entire rear area. But for complete victory in war, this is insufficient. In order to gain it, it is necessary to complete the rout of remaining and resisting formations of enemy armed forces and to occupy important strategic areas on enemy territory. At the same time, it is necessary to hold firmly one's own key strategic areas, to keep enemy troops from capturing the territory of one's own and allied nations, to repel enemy attempts to make naval and airborne landing in various regions and to provide for the security of one's own country from missile and air attacks. This can be achieved only as the result of combined operations of all branches of the armed forces which are at present qualitatively different.... In such a manner for complete victory over a strong enemy in modern

²⁹ Marshal of Artillery S. Varentsov, *Izvestia*, December 2, 1962. Found in Andrew W. Hull, "Soviet Long-Range Planning," *Armor*, Vol. 87, No. 4, July-August, 1978, 21.

³⁰ Gastilovich, *op. cit.* Also see Kurasov, *op. cit.*

³¹ Lieutenant-General L. Skvirskiy, "The Meeting Engagement in the Initial Period of a War," *Military Thought*, July 31, 1962. Declassified by the CI on January 6, 2012.

³² See Pavlov, *op. cit.*, and Poluboyarov, *op. cit.*

warfare besides rocket troops it is necessary to have all branches of the armed forces both technically well-equipped and in sufficient quantities and this means that large mass armies will be necessary.³³

While the debate continued, the Soviet military took steps to operationalize what it called the Revolution in Military Affairs – the advent of nuclear weapons and long-range missiles – and reconcile it with the traditional Soviet combined arms approach. The result is perhaps best captured in the 1962 and 1963 editions of *Military Strategy*, edited by Marshal V.D. Sokolovsky, Chief of the General Staff from 1953 to 1960. Sokolovsky examined the character of Soviet strategy and methods for conducting modern war, principally the role of nuclear weapons and the employment of ground forces. His treatment is considered to be one of the most authoritative sources on Soviet military doctrine during this period.

Military Strategy initially acknowledged many of the basic principles articulated by Khrushchev, namely that nuclear weapons had fundamentally altered the very nature of warfare. Fighting would be unprecedented in spatial and temporal scope, taking place across entire nations in a relatively short period of time. Unrestricted nuclear employment, specifically from the Strategic Rocket Troops, would play the decisive role. The prompt and conclusive potential attributed to nuclear weapons significantly increased the importance of the initial period of war.³⁴ Victory or defeat would be decided at the onset of hostilities, resting namely on the Soviet's ability to anticipate and preempt a western nuclear attack.³⁵

³³ Colonel A. Iovlev, "On Mass Armies in Modern War," *Military Thought*, No. 10, 1963. Declassified on August 9, 2000. Also see Major-General V. Kruchinin, "Contemporary Strategic Theory on the Goals and Missions of Armed Conflict," *Military Thought*, No. 10, 1963. Declassified by the CI on August 9, 2000, and Colonel Erich F. Pruck, "Kernwaffenpsychologie in der Sowjetunion," *Revue Militaire Generale*, May 1963. Translated and reprinted as "Nuclear Weapons and the Soviet Soldier," *Military Review* 44, no. 1 (January 1964): 75.

³⁴ Marshal V.D. Sokolovsky, ed., *Military Strategy: Soviet Doctrine and Concepts* (New York: Frederick A. Praeger Publisher, 1962), 198.

³⁵ *Ibid.*, 195

Operation Barbarossa, the surprise German invasion of the Soviet Union in 1941, had left an enduring mark on Soviet thinking. This drove Soviet planning to anticipate surprise and deny advantage by striking first. As noted by Sokolovsky, “it will be advisable to deliver a massed nuclear strike on the enemy troops, calculated to preempt a strike by the enemy.”³⁶ In the initial period of war in the European theater of operations – the critical period in Soviet and later Russian thinking – massive Soviet nuclear strikes would preemptively decimate NATO defenses, thereby constituting the main operation. Mobile strike groupings (i.e., armor and motorized infantry), aided by conventional aviation and artillery, would exploit the nuclear strike results by destroying the remnants of enemy forces and seizing key territory.³⁷

Preemption was imperative for the Soviet Navy, too. The main feature of naval warfare would include the delivery of nuclear strikes against important enemy sea and shore targets, particularly U.S. aircraft carriers and ballistic missile submarines, which could inflict nuclear harm on the Soviet military or population:

At the outbreak of war, missile-carrying submarines and long range aviation, like the rocket forces, will destroy with their strike vitally important rear installations and groupings deep in the interior of the theaters of military operations; the navy, using its submarines and aviation, must destroy with its first strikes the principal strike forces of the enemy navy carrying nuclear weapons at sea. Destroying nuclear missile submarines and aircraft carrier strike large units at the very inception of a war will deprive the enemy of the capability of carrying out in an organized manner his nuclear attack from sea to land which aims to inflict maximum

³⁶ Colonel S. Begunov and Colonel V. Glazov, “A Massed Nuclear Strike During a Front Offensive Operation,” *Military Thought*, no. 1 (68), 1963. Declassified by the CI on January 16, 2006.

³⁷ Major General of Tank Troops A. Shevchenko, “The Strike Groupings of a Front,” *Military Thought*, No. 3, 1960. Declassified by the CI on December 22, 2016.

damage on our naval forces, rocket forces, and ground forces, and of destroying important installations located both on the coast and in the interior of our country.³⁸

Moreover, preemptive nuclear strikes on opposing formations would buy time for the Soviet Union to employ its conventional forces and potentially mobilize reserve forces. According to one Soviet general office, “lack of readiness can be offset by the delivery of preemptive nuclear strikes against the enemy which will make it possible to inflict serious losses on him and to change the correlation of forces to our advantage quickly.”³⁹

Military Strategy acknowledged Gastilovich’s notion that the nature of strategic maneuver had been transformed. Rather than traditional methods of repositioning forces, maneuver would be dictated by the range of nuclear missiles. “[Maneuver is] a transfer of effort from one strategic direction or objective to another, mainly by the fire of nuclear weapons.”⁴⁰ Importantly, this alternation went far beyond maneuver to include the entire basis of future combat operations. Timing of any operation would be centered on the nuclear strike; the ground forces would utilize to the fullest extent the results attained by the rocket forces for the rapid fulfillment of their tasks.⁴¹

Significantly, *Military Strategy* differed from Khrushchev on the utility of ground forces:

³⁸ Captain First Rank N. Vyunenkov, “The Initial Strike in Armed Combat at Sea,” *Military Thought*, No. 1, 1964. Declassified by the CI on April 4, 2012. See also Captain First Rank Ye. Mamayev, “New Developments in Combat with Carrier Strike Large Units in the Initial Period of War,” *Military Thought*, No. 1, 1962. Declassified by the CI on June 28, 2013; Admiral V. Platonov, “The Missions of the Navy and Methods of Carrying Them Out,” *Military Thought*, No. 2, 1961. Declassified by the CI on April 18, 2012; and Rear Admiral Yu. Ladinskiy, “Assuring the Stability of Control of Naval Forces in a Missile/Nuclear War,” *Military Thought*, No. 2, 1964. Declassified by the CIA on January 16, 2006.

³⁹ Zav’yalov, *op. cit.*

⁴⁰ Sokolovsky, *op. cit.*, 15.

⁴¹ *Ibid.*, 281.

Military strategy under conditions of modern warfare becomes a strategy of deep nuclear-missile strikes in conjunction with operations of all branches of the armed forces in order to inflict a simultaneous defeat and destruction of the enemy's economic potential and armed forces throughout the whole depth of his territory, for the accomplishment of the war aims within a short time span.... Consequently, the leading branch of the armed forces will be the Strategic Missile Forces, and the role and mission of the other branches of the armed forces will be essentially changed. *However, final victory will be attained only as a result of the combined efforts of all the branches of the armed forces.*⁴²

Sokolovsky instead envisioned two strategic operations that served complementary roles: the massive nuclear strike (both theater and intercontinental) and combined-arms operations in the land theater. Each operation was to be conducted by specific forces in a precise space and time.⁴³ Here, 'jointness' denoted the strict correlation between the two operations within a single strategic plan under a unified centralized command.⁴⁴ The mass nuclear strikes would serve as the main operation of the conflict. The primary targets were strategic air bases principally located in Europe and the United States. Additional targets included military bases, industrial targets, communications, ports, and control posts in theater.⁴⁵ The basic aim was to "undermine the military power of the imperialist coalition by eliminating its nuclear weapons, eliminating its military and economic potential, destroying its economic foundation, and disrupting governmental and military control."⁴⁶ Near-simultaneously, ground operations in the European theater would exploit the results of the initial nuclear strike to impose final defeat on enemy troops and capture vital territory.⁴⁷ Despite the need for large ground forces, nuclear weapons

⁴² Ibid., 13 and 203. Emphasis added.

⁴³ Ibid., 285.

⁴⁴ Ibid.

⁴⁵ Ibid., 287.

⁴⁶ Ibid.

⁴⁷ Ibid., 289.

would be the principal means of combat in both strategic operations.⁴⁸ In this sense, general purpose forces were merely intended to exploit rather than create strategic outcomes in their own right.⁴⁹

Sokolovsky's conclusions were widely reinforced and expanded upon in classified Soviet military journals of the time⁵⁰ Strategy improvements resulted in important changes to Soviet force posture.

Organizationally, the front was the highest Soviet wartime field headquarters for the operational control of general purpose forces. Fronts did not exist in peacetime but would be formed from certain military districts and groups of forces in wartime. A front would generally consist of three or more field armies and a tactical air army plus combat and support units. In turn, an army had three to five divisions and additional supporting units. Nuclear-armed missiles and rockets were developed and integrated at the front, army, and division levels. For example, by the 1970s, typical front nuclear support would include possibly one SS-12 SCALEBOARD short-range ballistic missile (SRBM) brigade and up to two SCUD SRBM brigades of nine to twelve launchers each. An army would have nine SCUD SRBM launchers. Divisions would normally be equipped with four FROG rocket launchers (see Figure 18). As such, nuclear forces were placed in dedicated units controlled by higher echelons of command – though Soviet high command ultimately held launch authority.

⁴⁸ Ibid., 227.

⁴⁹ See “Warsaw Pact Politico-Military Strategy and Military Doctrine for the Tactical Use of Nuclear Weapons,” Nuclear Planning Group, NPG Study 45, March 5, 1974, 14. Declassified by NATO.

⁵⁰ Skvirskiy, *op. cit.* Also see Colonel General N. Fomin, “The Role and Control of Missile Units in the Ground Forces,” *Military Thought*, No. 4, 1962. Declassified on October 16, 2012; Colonel General P. Koshevoy, “Utilization of the Missile Troops of a Front (Army) In an Offensive Operation,” *Military Thought*, No. 3, 1961. Declassified; and S.I. Krupno, “According to the Laws of Dialectics,” *Krasnaya Zvezda*, January 7, 1966. Translated in William R. Kintner and Harriet Fast Scott, *The Nuclear Revolution in Soviet Military Affairs* (Norman: University of Oklahoma Press, 1968), 242.

Targets of front and army operations would include a wide-range of vitally important military and civilian infrastructure, as well as field formations.⁵¹ As noted, front and army capabilities were regarded as an adjunct to the strategic strike forces – to provide battlefield strikes to support advancing ground forces.⁵² Nonetheless, the former had high readiness standards to meet exacting synchronization needs: “Not less than 50 percent of the rocket troops and about 70 to 80 percent of their available aircraft must be kept ready at all times to deliver [nuclear] strikes.”⁵³ Moreover, while the initial, massive nuclear strike was expected to be the decisive operation of a conflict, successive strikes could also be required, including those delivered from the front and army level capabilities.⁵⁴ As a result, additional waves of massed strikes could occur throughout the course of the conflict

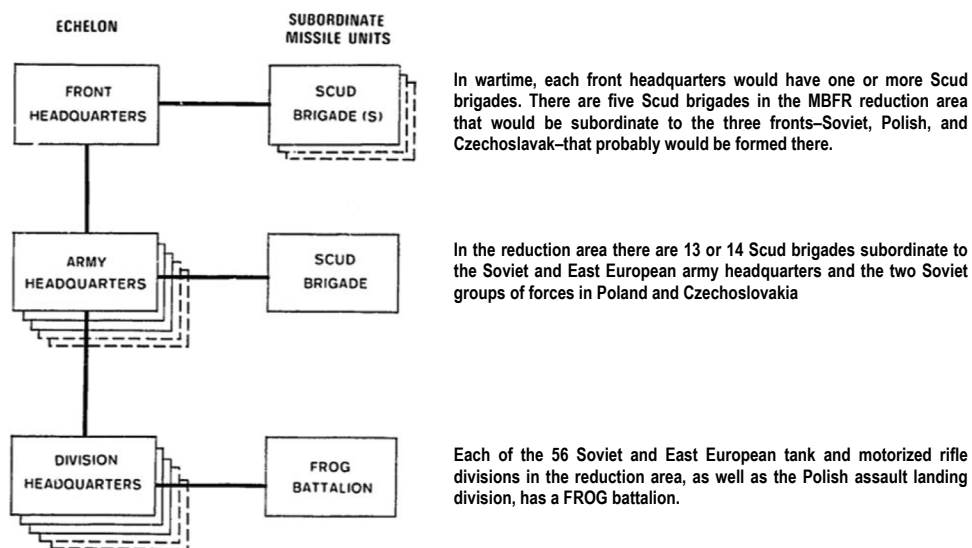


Figure 18: Organization of nuclear delivery systems in Warsaw Pact ground forces (1970s). From “Warsaw Pact Tactical Nuclear Forces in Central Europe,” Joint Memorandum, National Security Agency and Defense Intelligence Agency, March 1975, 6. Declassified on September 29, 2003

⁵¹ Marshal of Artillery S. Varentsov, “The Outlook for the Development of Missile Weapons for the Ground Forces,” *Military Thought*, No. 2, 1961. Declassified by the CI on June 30, 1992.

⁵² “Warsaw Pact Tactical Nuclear Forces in Central Europe,” Joint Memorandum, National Security Agency and Defense Intelligence Agency, March 1975, 3. Declassified on September 29, 2003

⁵³ Begunov and Glazov, *op. cit.*

⁵⁴ Colonel-General N. Pavlovskiy, “The Initial Period of a Future War and the Special Features of the Conduct of Military Operations During this Period,” *Military Thought*, No. 1, 1962. Declassified by the CI on April 12, 2012.

In terms of training and exercising, declassified Soviet and Warsaw Pact documents illuminate the intended scope and scale of the nuclear offensive in Europe. Papers from East Germany's military archive cover Command Post Exercise Buria in 1961, the first major Warsaw Pact exercise carried out under nuclear conditions. The exercise scenario posited a NATO advance to West Berlin and nuclear first strike following a Soviet decision to end Berlin's special status. Postulated Warsaw Pact forces numbered over one million men, with more than 350 SCUD and FROG launchers, as well as 100 nuclear-capable aircraft. In the initial Soviet-led operation of the exercise, 1,600 Soviet front and army-level nuclear weapons were employed:

In their first 'strategic' nuclear strike, Warsaw Pact forces would attack a total of 1,200 stationary NATO targets (422 in West Germany) within 30 minutes with approximately 400 nuclear attacks on mobile targets such as troop concentrations or nuclear weapons. The political and military leadership of the Federal Republic would be paralyzed for 8 to 10 days. 70% of [theater nuclear weapons] and 90% of the radar stations and airfield in West Germany would be immediately destroyed. Nuclear weapons would kill or incapacitate 40% of the troops they were used against. Losses of weapons and equipment would be up to 60%.... Enormous numbers of dead, injured, and radiation diseased civilians would confront medical services with insoluble problems. Nevertheless, after this decisive initial exchange, Warsaw Pact troops would storm on to Paris and reach Calais on the 10th day.⁵⁵

Another example comes from formerly restricted 1964 Warsaw Pact operational planning documents. The documents detail the assignments and expectations of the "Czechoslovak Front" in an invasion of Western Europe. The objective was to reach Lyon on the ninth day of fighting. Following indications that NATO was preparing for offensive operations, Warsaw Pact forces would preemptively destroy vitally important installations and formations.

⁵⁵ Matthias Uhl, "Storming onto Paris," in Vojtech Mastny, Sven G. Holtsmark, and Andreas Wenger, ed., *War Plans and Alliances in the Cold War: Threat Perceptions in the East and West* (London, UK: Routledge, 2006), 63-65. Quickly securing valuable ports would also restrict the prospect for reinforcement from the United States, United Kingdom, and Canada.

In the first massive nuclear strike by the troops of the Missile Forces of the Czechoslovak Front, the front aviation, and long-range aviation added to the front must destroy the main group of troops of the first operations echelon of the 7th U.S. Army, its means of nuclear attack, and the centers of command and control of the aviation. During the development of the operation, the troops of the Missile Forces and aviation must destroy the approaching deep operative reserves, the newly discovered means of nuclear attack, and the enemy aviation. Altogether the operation will require the use of 131 nuclear missiles and nuclear bombs; specifically 96 missiles and 35 nuclear bombs.... Building on the results of the first nuclear strike, the troops of the Front, in coordination with units of the 1st Western Front must destroy the main group of troops of the 7th U.S. Army and the 1st French Army in cooperation with airborne assault troops, force the rivers Neckar and Rhine in crossing, and defeat the advancing deep strategic reserves of the enemy in advancing battle, and by D 7-8 take control of the areas of Langres, Besançon, and Epinal.⁵⁶

According to Czech military officials the Southwestern Front was well informed and prepared for synchronized operations as well. Core objectives and tactics outlined in the 1964 plan for the use of nuclear weapons were known and exercised. Senior Czech military official from the pre-1968 (Soviet invasion) era recognized that the preemptive use of nuclear weapons was critical for the successful accomplishment of the 1964 plan.⁵⁷

Exercises such as these highlighted core challenges confronting the integration of nuclear weapons within military doctrine throughout this period. For example, inefficient utilization of nuclear munitions was a

⁵⁶ Petr Lunák, "Planning for Nuclear War: The Czechoslovak War Plan of 1964," in Christian F. Ostermann, eds., "End of the Cold War," *Cold War International History Project Bulletin*, Nos. 12/13, Fall/Winter 2001.

⁵⁷ Karel Sieber and Vojtech Mastny, eds., "Oral History Interviews with Czechoslovak Generals: Soviet-Czechoslovak Military Planning in the Cold War," Parallel History Project on NATO and the Warsaw Pact, January 2005.

recurring Soviet theme. Because most commanders at the division-level and higher were products of the last war (and Stalinist thinking which perpetuated traditional fire planning models), they frequently expended nuclear warheads at a high rate in planning and exercises.⁵⁸ As noted by one Soviet military officer

We have cases in which many problems in the preparation and conduct of modern operations are decided from the standpoint of the past with insufficient regard for the particular features of a nuclear/missile war. The nuclear warheads released for an operation will, as the Minister of Defense points out, often be hastily expended as quickly as possible by using obsolete methods of artillery preparation against insufficiently reconnoitered targets.⁵⁹

This was often a result of underestimation of the unique characteristics of nuclear weapons:

The experience of command-staff exercises and of exercises with troops shows that the staffs, when planning missile/nuclear strikes, often fail to take into consideration the nature of the targets and the fire capabilities of missile units and large units. The yields of nuclear charges needed for the destruction of specific targets are estimated by eye (*na'glazok*), without taking into account the actual characteristics of the missiles or the nature of the targets. Estimates of the expected result from each missile/nuclear strike and of the possible enemy losses suffered from a massed strike are not made. All this produces a wasteful expenditure of powerful means of destruction and as a result, considerably reduces the fire effect upon the enemy.⁶⁰

⁵⁸ Fomin, *op. cit.*

⁵⁹ Colonel-General V. Chizh, "Planning the Utilization of Nuclear/Missile Weapons in a Front Offensive Operation," *Military Thought*, No. 3, 1961. Declassified by the CI on January 12, 2012.

⁶⁰ Varentsov, 1961, *op. cit.*

In addition, integration between armies and fronts was a recurring challenge. Soviet military doctrine stressed strict coordination between large formations. Each organization would plan nuclear strikes not only in their own offensive zone but also on the flanks resulting in two armies or fronts accounting for the same targets.⁶¹ Adjacent fronts and armies often failed to coordinate targets properly, leading to an over expenditure of nuclear munitions. In other situations, front and army-level nuclear munitions were not incorporated into the initial strategic nuclear strikes.⁶² Moreover, during the land warfare operation, some Soviet writers expressed concern that not enough attention was being devoted to articulating the envisioned role and targets ascribed to advancing operational-tactical and tactical missile units.⁶³

Likewise, the relationship between nuclear and conventional planning required constant supervision. Indeed, some Soviet military planners continued to view operational art through a parochial lens, thereby prohibiting movement toward more integrated operational planning. As explained by a senior Soviet general:

The leading role of missile/nuclear strike[s] is formally acknowledged and the working out of a combined-arms decision begins with them; however, time and again, the main thing in the concept is considered to be the selection of axes of the actions of the armies and divisions and the correct drawing of the arrows designating these axes. It is enough to take a look at many of our operations plan maps to be convinced of this: among the arrows piercing through the whole operational disposition of the enemy and his territory we often have difficult findin the targets to

⁶¹ Colonel P. Shkarubskiy and Colonel V. Godelvich, "Control of Missile Units of the Ground Forces in Offensive Operations," *Military Thought*, No. 2, 1962. Declassified by the CI on January 16, 2006. Also see Colonel G. Yefimo, "Coordination of Adjacent Units during the Use of Nuclear/Missile Weapons in Operations," *Military Thought*, No. 6, 1961. Declassified by the CI on December 22, 2016.

⁶² Major-General N. Stashek, "Considering Participation of Army Missile Weapons in the Initial Nuclear Strike," *Military Thought*, No. 6, 1961. Declassified by the CI on January 13, 2012.

⁶³ Lieutenant-General of Artillery V. Goffe, "The Combat Use of an Independent Missile Battalion," *Voennaya Vestnik*, No. 34, 1961. Declassified by the CI on January 13, 2012.

be subjected to missile/nuclear strikes, which, in addition, are scattered over enormous spaces.

We are not even mentioning the cases of separately representing the use of nuclear means and the actions of ground forces on different maps – here, as it were, not only is the leading role of nuclear strikes geographically denied, but the very organic connection of nuclear strikes and troop actions is even torn apart.⁶⁴

Consequently, Soviet planners acknowledged the need to dissolve barriers between nuclear and conventional forces:

[T]here can be no separate plan for the utilization of nuclear/missile weapons. Nuclear/missile weapons and combined arms large units and formations cannot be used when isolated from one another.... Operations by ground troops are now impossible under any conditions without the aggressive use of nuclear/missile weapons in both operational and tactical elements.⁶⁵

As Soviet planners delved deeper into the implications of nuclear-conventional integration, it became clear that ground troops moving to exploit the results of the initial and successive massed nuclear strikes would need to confront numerous nuclear hazards (to include radiological contamination, fires rubble, and more). Their inability to operate on a nuclear battlefield would be detrimental, if not fatal, to the strategic operation as a whole. Soviet planners therefore devoted significant attention toward “anti-atomic” measures (see Figure 19), to include construction of defensive structures, dispersion, and the utilization of

⁶⁴ Fomin, *op. cit.*

⁶⁵ Chizh, *op. cit.*

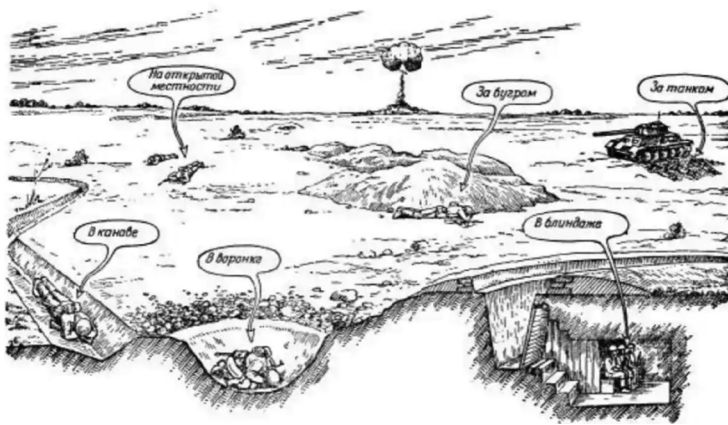


Figure 19: Soviet troop instruction on protection against nuclear weapons. From A.I. Ivanov and G.I. Rybkin, *The Striking Effect of a Nuclear Explosion* (Moscow: 1960). Reprinted and translated by the U.S. Armed Services Technical Information Agency, September 12, 1962.

geographic features to protect troops from nuclear effects.⁶⁶ In addition, preemptive nuclear strikes against NATO nuclear forces to limit damage to advancing forces were also considered vital in anti-

atomic defense.⁶⁷ Indeed, some Soviet planners went so far as to conclude that damage limitation (i.e., limiting nuclear attacks and resulting damage and casualties to its own forces by focusing on destroying the nuclear-capable forces of its opponent) throughout the course of the campaign was the most efficient means of anti-atomic defense.⁶⁸ In spite of the expected harsh conditions, the Soviets did not anticipate significant delays in reaching operational objectives. Instead, nuclear fires would greatly augment the estimated rate of advance across the theater of operations, from 40 to 100 km per day.⁶⁹

⁶⁶ For example, see Major-General A. Isayuk, "The Protection of Troops against Weapons of Mass Destruction," *Military Thought*, April 3, 1962. Declassified by the CI on January 18, 2012; A Guide to the *Combat Characteristics of Atomic Weapons and the Means of Antiatomic Protection*, Chapter XI, Soviet Armed Forces, 1957. Declassified by the CI on January 13, 2012; Colonel D. Shein, "The Meaning of The Protection of Troops Against Weapons of Mass Destruction," *Military Thought*, No. 1, 1962. Declassified by the CI on September 26, 2012; Colonel D. Shein, "Forewarning and Notifying Troops about Radioactive Contamination," *Military Thought*, No. 3, 1961. Declassified by the CI in December 2004; Colonel G. Luzzin, "Actions by Troops in Zones of Radioactive Contamination in a Battle and Operation," *Military Thought*, No. 3, 1962. Declassified by the CI on January 16, 2006; and Major I. Grabovoy, "Protection of Troops against Toxic and Radioactive Substances and Bacterial Means," *Military Thought*, No. 1, 1964. Declassified by the CI on January 16, 2006.

⁶⁷ Lieutenant-General of Tank Troops M. Shaposhnikov, "Combat with Tactical Nuclear Weapons," *Voennaya Vestnik*, No. 34, 1961. Declassified by the CI on January 13, 2012.

⁶⁸ Stashek, *op. cit.*

⁶⁹ "XXX" (Anonymous), "L'Adaptation des Forces Terrestres Soviétiques a une Guerre Nucléaire," *Revue de Défense Nationale*, February 1966. Translated in "Adaptation of Soviet Ground Forces," *Military Review* 46, no. 9 (September 1966): 11.

Soviet planners demonstrated a tendency to underestimate friction in synchronizing nuclear and non-nuclear operations

Yet sustained resistance to Khrushchev prohibited greater attention to these

issues. Rather than explore the force implications resulting from NATO's "Flexible Response" strategy, most Soviet military leaders sought to present united opposition to Khrushchev's nuclear-dominated vision.⁷⁰ "In order to maintain a strong, unified coalition against Khrushchev, the issues of Ground Force resources and conventional war-planning had to be kept separate until Khrushchev was out of the way."⁷¹ Consequently, enduring problems regarding integrated operations within Soviet doctrine would not be resolved until after Khrushchev's ouster, which came in 1964.

3. Consideration of Conventional-only and Limited Nuclear Combat (Mid 1960s-Mid 1970s)

After the ouster of Khrushchev, there was a general recognition in the Soviet military elite that the utility of nuclear weapons had been overestimated. The near exclusive concentration on nuclearization of the force precluded the Soviet Union from meeting threats below the level of general nuclear war.⁷² This, at a time when the United States had shifted its own strategy to strengthen conventional defenses in Europe and provide greater nuclear flexibility. Consequently, Soviet military thinkers began a search for a more holistic approach to warfare, one that incorporated a distinct role for conventional forces. From 1965 to the mid-1970s, a significant number of articles in formerly classified Soviet military journals were devoted to overcoming this problem. This resulted in a reexamination of how a conflict with the West might be fought and a modified formulation regarding the appropriate role for Soviet conventional forces. Despite its relook, however, the central tenets

⁷⁰ Kimberly Marten Zisk, *Engaging the Enemy: Organization Theory & Soviet Military Innovation, 1955-1991* (Princeton, NJ: Princeton University Press, 1993), 58, 62, and 68-69.

⁷¹ Ibid., 68-69.

⁷² Dennis M. Gormley, "Understanding Soviet Motivations for Deploying Long-Range Theater Nuclear Forces," *Military Review* 61, no. 9 (September 1981): 32.

of Soviet strategy remained unchanged: should conflict occur, preempt Western forces and seize key terrain across Europe.

Given alterations to U.S. strategy, Soviet generals now assessed that conflict could initiate with a conventional period.⁷³ This was an important departure from strategy under Khrushchev, in which conflict with the United States would be global and nuclear from the outset. This conventional period was viewed as an opportunity to exploit the Warsaw Pact's numerical superiority in general purpose forces in and around the European theater. The non-nuclear phase, however, would not be indefinite. Most Soviet scenarios envisioned the non-nuclear period lasting hours to days depending on the Warsaw Pact's conventional success.⁷⁴ The expectation was that NATO would employ nuclear weapons at the first main defensive line in Germany and would always execute nuclear operations to prevent a Rhine River crossing.⁷⁵ Thus, the non-nuclear phase was viewed as a prelude to nuclear operations.⁷⁶

Conceptualizing the appropriate relationship between conventional and nuclear forces, and operationalizing those concepts was the most important task for Soviet military leaders, as they underpinned the entire Soviet approach to conflict with a nuclear-armed peer adversary.

The prospect of a conventional period, however limited, left gaps in Soviet thinking. Non-nuclear operations would obviously differ in important ways from those in a large-scale nuclear environment. During the former, completing strategic tasks was considered doubtful. For example, NATO's deep rear areas and reserve forces would likely

⁷³ Marshal N. Krylov, "The Nuclear Missile Shield of the Soviet State," *Military Thought*, November 1967, 17; Major-General V. Zemskov, "Characteristic Features of Modern Wars and Possible Methods of Conducting Them," *Military Thought*, July 1969, 19.

⁷⁴ Major General William E. Odom, "The Soviet Approach to Nuclear Weapons: A Historical Review," *The Annals of the American Academy of Political and Social Science*, Vol. 469, Nuclear Armament and Disarmament, September 1983, 130.

⁷⁵ Interview with General Colonel A.A. Danilevich in John G. Hines, Ellis M. Mishulovich, and John F. Shull, "Soviet Intentions 1965-1985, Vol. II: Soviet Post-Cold War Testimonial Evidence," BDM Federal, Inc., September 22, 1995, 24.

⁷⁶ Warner III, *op. cit.*, 20-25.

go untouched, since Soviet long-range conventional weapons lacked accuracy and lethality.⁷⁷ Similarly, without recourse to nuclear weapons, Soviet conventional forces would need to execute near-constant strikes to make even modest gains. NATO defensive positions aided by modern anti-tank weapons and rapid troop transport would require high-density fire from Soviet tanks and artillery, which would likely suffer significant attrition rates.⁷⁸ To attain the required mass for a conventional offensive, fronts and armies would need to limit the number of strike axes and breakthrough sectors (generally one or two for a non-nuclear period), thereby condensing the strength that could be brought to bear at any one time.

How best to conceptualize and operationalize the conventional-nuclear periodization of war in planning became a central debate within Soviet military journals. Some thinkers, such as Lieutenant General V. Petrenko, argued for the development of a special, independent plan for the conduct of front and army offensive operations using only conventional means. Because determining in advance the duration of a non-nuclear period would be extremely difficult, Petrenko suggested that planning proceed from the basis of conventional forces accomplishing tasks assigned to the nuclear forces (i.e., destroying an opposing enemy to his entire depth). Petrenko dismissed the notion that two discrete plans would make training more difficult and produce confusion, citing the character of conflict under non-nuclear conditions as sufficiently different to devise a separate plan. Others countered Petrenko's formulation. With the constant threat of nuclear attack, Soviet forces must be ready at any moment for the transition to nuclear operations. This view favored a single plan that meticulously mapped out an entire offensive, regardless of its beginning. As noted by Colonel General I. Glebov, "to plan a front offensive operation with several variants would naturally hinder the preparation of the troops to carry out tasks during an operation and would complicate troop control from the outset of military operations."⁷⁹

⁷⁷ Colonel-General I. Glebov, "Certain Problems of Planning and Conducting Offensive Operations," *Military Thought*, No. 3, 1967. Declassified by the CIA on 28 September 2012.

⁷⁸ Ibid.

⁷⁹ Ibid.

Such debates helped inform a new approach that incorporated a non-nuclear variant into the overarching operation plan. Overall, ground forces would seek to degrade important groupings of the first adversary echelon, overcome difficult obstacles, and seize objectives that would be advantageous for follow-on offensive operations with subsequent use of nuclear weapons.⁸⁰ A second and potential third echelon, located behind the first echelon to protect against nuclear attack, would then penetrate and exploit the results of the initial assault. Speed and timing were critical. As noted by Colonel V. Chervonobab, "Time was the 'coin of the realm'.... The initial conventional strikes had to seize as many enemy's [*sic*] critical targets as possible to disrupt the enemy's defensive position."⁸¹ Troop and armored formations remained an important feature of the Soviet assault, with both quickly concentrating from various directions and depths to execute an attack, then dispersing again.⁸² Variance came from a new degree of flexibility afforded to field commanders to tailor the non-nuclear phase as needed. For example, a limited number of axes and breakthrough sectors would be established, which could be expanded following the initiation of nuclear strikes. The width of the offensive zone of operations would remain the same for either type of conflict though the boundaries between units within would be adapted as needed. Rates of advance would be prescribed based on the battlefield conditions, ranging from around 20 to 30 km per day with only conventional forces and 40 to 50 km when employing nuclear weapons.⁸³ As such, expanding the time to achieve operational objectives during the conventional phase was permitted.⁸⁴

⁸⁰ B. Samorukov, "Combat Operations Involving Conventional Means of Destruction," *Military Thought*, August 1976, 28-30. Found in Phillip A. Petersen and John G. Hines, "Military Power in Soviet Strategy against NATO," *The RUSI Journal* 128, no. 4 (1983): 53.

⁸¹ Colonel V. Chervonobab, "Principles of Military Art Applied to Nuclear Combat," *Military Thought*, No. 11, November 1971. Translated by Foreign Press Digest and reprinted in *Strategic Review* 9, no. 3 (Summer 1981): 86.

⁸² Ibid.

⁸³ Interview with General M.A. Gareev, in John G. Hines, Ellis M. Mishulovich, and John F. Shull, *op. cit.*, p. 74.

⁸⁴ Colonel A. Kurkov, "Problems of Conducting Military Operations during a Nonnuclear Period (Combat Operations of a Tank Army)," *Military Thought*, 1975. Declassified by the CIA on April 11, 2012.

A core challenge inherent in modifying Soviet strategy to incorporate a non-nuclear phase was establishing conventional and nuclear munitions requirements. Enhanced conventional means were developed to improve strike options. Prior to this point, tactical missile and rocket inaccuracies compelled the Soviet Union to deploy such weapons with nuclear warheads over 100 kt. With the advent of the SS-12 Mod 1, SCUD B, and FROG 7 ballistic missiles, high-explosive warheads were deployed to provide the Warsaw Pact with an extremely limited conventional option for large and soft targets (it would not be until the next doctrinal period that the Soviet General Staff assessed it had acquired truly dual-capable tactical missile systems).⁸⁵ As noted in 1971 by Secretary of Defense Melvin R. Laird, “In particular, the increase in [conventional] firepower has enhanced the Pact’s capability to overcome organized NATO defenses in the absence of the nuclear strikes which formerly were relied upon to blast holes for the passage of armored striking forces in the opening phase of a European war.”⁸⁶ Yet far more munitions were required for conventional operations compared to nuclear scenarios. For example, one Soviet military analyst noted that nearly twice as many artillery munitions were needed for a non-nuclear period compared to the same tasks during nuclear war.⁸⁷

Exacerbating the munitions problem was the need to withhold a certain amount of nuclear-capable forces to execute the nuclear mission set. Simply put, more forces earmarked for nuclear operations lessened those that would be available to support objectives during the non-nuclear phase. Soviet posture and force structure choices reflected this trade-off. As a declassified U.S. intelligence memorandum made clear, “Despite the important role attributed to the conventional phase, Soviet planners viewed this phase largely as a transitional step to nuclear war.”⁸⁸ Up

⁸⁵ “Soviet Short-Range Ballistic Missiles and the Impact of a Ban on Long-Range INF Missiles,” Interagency Intelligence Assessment, Central Intelligence Agency, March 15, 1987, 7. Declassified

⁸⁶ “Soviet Concepts of War in Europe: Transition from Conventional to Nuclear Conflict,” Intelligence Memorandum to the Honorable Melvin R. Laird, Secretary of Defense, May 5, 1971. Declassified on July 18, 2012

⁸⁷ Colonel Ye. Yefimov, “The Actual Requirement for and Supplying of Troops with Conventional Ammunition in Present-Day Operations,” *Military Thought*, No. 3, 1965. Declassified by the CI on October 3, 2012.

⁸⁸ “Soviet Concepts of War in Europe,” *op. cit.*

to 80 to 90 percent of rocket troops, 60 to 70 percent of aircraft in the long-range aviation, and 30 percent of frontal aviation would likely need to be postured for nuclear operations.⁸⁹ Just prior to conflict, front strike aircraft and rocket forces would disperse with nuclear weapons.⁹⁰ During a conflict, nuclear forces would be placed on “full” alert, with four different readiness classifications for weapon system types. A SS-12 SCALEBOARD SRBM, for example, would be generated to either “No. 1,” strike in four minutes; “No. 2A,” strike within 20 minutes; “No. 2,” strike within 30 minutes; or “No. 3,” strike within 40 minutes.⁹¹

Limited ability to swap conventional and nuclear warheads at sea locked the Soviet Navy into apportioning a high percentage of its missiles and torpedoes to the nuclear mission.

The nuclear-conventional trade-off problem was particularly acute for Soviet naval forces. Weapon combinations needed to be determined before

combat deployments since Soviet naval forces had limited warhead interchangeability and reload capability at sea.⁹² Soviet military analysts suggested at least half of all submarine-launched cruise missiles be nuclear,⁹³ for a submarine whose assignment precluded group operations, all of its sea-launched cruise missiles should be nuclear. Soviet frontline

⁸⁹ Jan Hoffenaar and Christopher Findlay, eds., *Military Planning for European Theatre Conflict During the Cold War: An Oral History Roundtable*, Stockholm, April 24-25, 2006 (Zürich, SZ: Center for Security Studies, 2006), 161. Also see Colonel A. Postovalov and Colonel I. Pivovar, “The Transition from Combat Operations with Exclusive Use of Conventional Means of Destruction to the Use of Nuclear Weapons,” *Military Thought*, No. 2, 1967. Declassified by the CIA on April 18, 2012.

⁹⁰ Arbman and Thornton, *op. cit.*, 34.

⁹¹ The SCUD-B and FROG 7 generation timelines were also described in Major-General A. Romashkin, Colonel V. Ivanov, Colonel A. Zubulin, and Lieutenant Colonel A. Mironenko, “Increasing the Effectiveness of the Initial Nuclear Strike of a Front During an Offensive Operation,” *Military Thought*, No. 1, 1970. Declassified by the CI on June 12, 2012.

⁹² Gordon H. McCormick, “Problems of Sea Control in Theater Nuclear War,” Prepared for the Assistant to the Secretary of Defense, System Planning Corporation, October 1, 1980, 17.

⁹³ “The Role of Interdiction at Sea in Soviet Naval Strategy and Operations: An Intelligence Assessment,” National Foreign Assessment Center, Central Intelligence Agency, May 1978, 30. Declassified by the CI on June 2017.

submarines, regardless of class, were to be armed with at least two nuclear torpedoes; for attack submarines assigned to anti-aircraft carrier operations, as many as one-third of all torpedoes would be nuclear.⁹⁴ Nuclear weapons dispersed across the fleet minimized the impact a single vessel loss would have on the aggregate posture. To compensate for the small number of conventional weapons, naval units would concentrate their non-nuclear fires. Though such operations would decrease the number of units available for other non-nuclear tasks, high-density attacks would complicate opponent defensive planning and lessen conventional expenditures by any one platform.

Acceptance of a non-nuclear phase of conflict did not supplant the Soviet penchant for pre-emption but rather was complemented, if not subsumed, by it. While non-nuclear forces would perform traditional combat operations to seize key installations and defeat enemy groups, their most important mission was to degrade, to the greatest extent possible, Western nuclear forces and supporting infrastructure.⁹⁵ Indeed, Soviet planners assumed NATO was prepared to employ nuclear weapons first in a conflict – potentially within the first hours or days – to counter Pact conventional advantages. Thus, it was imperative for Soviet operations to degrade, disrupt, and defeat Western nuclear forces as early as possible. For example, Soviet naval authors emphasized the need to attack aircraft carriers and nuclear-capable missile submarines and surface ships during the conventional phase, a view that was reflected in classified Warsaw Pact strategy lectures during this period (though as fear mounted over its own

⁹⁴ Ibid.

⁹⁵ Samorukov, *op. cit.*, 30; Also see Postovalov and Pivovarov, *op. cit.*

SSBN vulnerability, the Soviet Union shifted to a withhold strategy in which attack submarines, surface vessels, and air assets conducted anti-submarine warfare activities in defense of friendly SSBN operating areas).⁹⁶

As noted above, echeloning forces, which would coalesce at a planned time or objective, allowed the Soviets to address the need for dispersion and mass simultaneously. In short, Soviet military planners remained certain that nuclear war would follow the conventional phase and therefore the latter should help position the USSR for the former.

Soviet conventional preemption of NATO's nuclear forces was a highly innovative concept for its time. It also over-looked the risk that it could precipitate NATO nuclear use.

Soviet military thinkers gave little weight to the prospect that non-nuclear attacks against Western nuclear forces might exacerbate pressures on NATO to escalate a conflict. Rather, as explained by British scholar Beatrice Heuser, the prevailing Soviet assumption

throughout the Cold War was that the only way to limit damage to the Soviet Union was to degrade NATO nuclear forces, infrastructure, and associated command, control, and communications.⁹⁷ Rather than rely on deterrence and escalation management concepts, to which Soviet analysts never fully ascribed, conventional counter-nuclear operations would

⁹⁶ It should be noted that both Soviet military analysts and U.S. intelligence reports highlighted the difficulty in finding and destroying U.S. SSBNs at sea, though Soviet nuclear-powered submarines, principally V- and U-class submarines, would probably patrol off Polaris-equipped SSBN bases in the United States and Europe in an attempt to detect, track, and defeat U.S. missile submarines. See Rear Admiral N.F. Gonchar, "Some Problems of Combat with Nuclear Missile Submarines," *Military Thought*, No. 3, 1968. Declassified by the CI on 16 June 2017; Rear Admiral V. Saakyan, "Some Aspects of an Operation to Destroy Enemy Missile Submarines," *Military Thought*, No. 2, 1975. Declassified by the CI on 16 June 2017; Major-General of Naval Aviation P. P. Nevzorov, "The Problems of Combat Against the Submarine Missile/Nuclear Danger," *Military Thought*, No. 3, 1966. Declassified by the CI on 16 June 2017; Rear Admiral I. Sysoyev, "The Role of Surface Vessels in Combat at Sea," *Military Thought*, No. 2, 1968. Declassified by the CI on September 26, 2012; and Rear Admiral A. Brezinskiy, "Naval Combat Operations Employing Only Conventional Means of Destruction," *Military Thought*, April, 1974. Declassified by the CI on April 18, 2012.

⁹⁷ Beatrice Heuser, "Warsaw Pact Military Doctrines in the 1970s and 1980s: Findings in the East German Archives," *Comparative Strategy* 12, no. 4 (1993): 439.

help limit the level of nuclear damage NATO could inflict against the USSR given the enduring assumption that NATO nuclear employment to counter Soviet forces was inevitable. This conventional attrition of nuclear forces was an innovative form of synchronization, one that generally was absent from Western planning until the U.S. *Maritime Strategy* of the late 1970s-early 1980s.

Nonetheless, it was incumbent on Soviet military planners to identify throughout the non-nuclear phase actions they believed indicated a NATO decision to release nuclear weapons. Starting in the mid-sixties, Soviet assumptions held that NATO would deliver about 60 percent of its nuclear weapons in the first massive strike following sustained conventional setbacks.⁹⁸ Pre-empting imminent NATO nuclear use with a nuclear strike of its own – or failing that, a simultaneous nuclear exchange (described as a “counter-meeting” strike) – was envisioned as the chief Soviet means of limiting damage. As explained by Soviet military experts, “The preemptive destruction of enemy nuclear attack means plays a major role in the successful conduct of a ground forces offensive and in effecting the total defeat of an enemy under the conditions of modern war.”⁹⁹ For the Soviet military, indicators of NATO preparations to introduce nuclear weapons into a conflict included loading nuclear weapons on strike aircraft, changing codes in nuclear force communications, increased aerial reconnaissance, transmitting specific Emergency Action Messages, or deploying conventional forces to operate under nuclear conditions.¹⁰⁰ As noted by General Lieutenant G.V. Batenin,

If we detected preparation by NATO to launch nuclear strikes, and we believed we would know when this was happening, we would want to strike NATO’s launch and control systems with nuclear strikes of our own.... We would detect mating of warheads to

⁹⁸ “Soviet Doctrine for Nuclear Strikes on Command and Communications Systems,” Central Intelligence Agency, December 1975, 16-17. Declassified by the CIA on July 18, 2012.

⁹⁹ Lieutenant-General V. Petrenko, Colonel V. Ryabchuk, and Colonel M. Belovskiy, “Combat with Enemy Tactical Means of Nuclear Attack in Offensive Operations,” *Military Thought*, No. 1, 1969. Declassified by the CIA on April 19, 2012.

¹⁰⁰ “Warsaw Pact Tactical Forces: Capabilities and Readiness for Nuclear War,” *op. cit.*

missiles and uploading of nuclear bombs and artillery. We listened to the hourly circuit verification signal on your nuclear release communications systems and believed we would recognize a release order. Under these conditions when we detected NATO actually preparing to launch, we would want to preempt your launch with our own nuclear strikes.¹⁰¹

In preparation for the presumed transition to nuclear combat operations, Soviet nuclear planning was continually modified during the non-nuclear phase.¹⁰² Nuclear strike plans were carefully crafted and orchestrated to avoid unnecessary inefficiencies. Elements from the Main Operations Directorate of the General Staff would directly assign operational objectives to each front and specify the resources to accomplish them.¹⁰³ Division, front, and army commanders would then choose the means and methods of nuclear operations in their respective zones of responsibility.¹⁰⁴ Command staffs would update their nuclear strike plans, primarily through their Nuclear and Fire Planning Groups (NFGPs). Each NFGP plan would then be consolidated, aligned, and adjudicated at the next higher-level command, with final approval residing back at the General Staff.¹⁰⁵

A tightly coordinated plan served two purposes. First, it connected top Soviet leaders with developments at the tactical level, which theoretically enabled them to order rapid adjustments. Paradoxically, this tight control

¹⁰¹ Interview with Lieutenant-General G.V. Batenin, *op. cit.*, 7.

¹⁰² "Soviet Concepts for Employment of Nuclear Weapons in a Conflict with NATO – Evidence from Warsaw Pact Military Exercises," Memorandum, Office of Strategic Research, Central Intelligence Agency, March 24, 1978, 2. Declassified by the CIA on July 18, 2012; "Soviet Planning for Front Nuclear Operations in Central Europe: An Intelligence Assessment," Office of Soviet Analysis, Directorate of Intelligence, Central Intelligence Agency, June 1983, 1. Declassified by the CIA on July 18, 2012.

¹⁰³ "Soviet Planning for Front Nuclear Operations in Central Europe," 2-5.

¹⁰⁴ Major-General I. Zav'yakov, "The Evolution of the Correlations of Strategy, Operational Art, and Tactics," *Military Thought*, No. 11, 1982. Found in Stephen M. Meyers, "Soviet Perspectives on the Paths to Nuclear War," in Graham Allison, Albert Carnesale, and Joseph S. Nye, Jr., eds., *Hawks, Doves, and Owls: An Agenda for Avoiding Nuclear War* (New York: W. W. Norton and Company, Inc., 1986), 186-187.

¹⁰⁵ "Warsaw Pact Tactical Forces," *op. cit.*, 3.

was seen in the Soviet context as providing flexibility, that is, a means “to render that top level control rapidly and effectively responsive to local battlefield requirements.”¹⁰⁶ Because operational objectives had been communicated in advance by the General Staff, the Soviet nuclear planning approach also was intended to ensure that lower commands understood clearly how to proceed in the event higher command and control was interrupted.¹⁰⁷ As noted by Colonel V. Chervonobab, tight coordination would continue amongst subordinate levels even if higher commands were temporarily paralyzed during a nuclear war, since “even brief disruption disorganizes troops’ actions, diminishes the force of attack, and leads to unjustified losses.”¹⁰⁸

Once the nuclear strike order was given, Soviet documents indicated that the attack would begin with a Strategic Rocket Force strike (in theater this would be executed by SS-4 MRBMs, SS-5 IRBMs, some number of SSBNs, and strategic bombers) to be followed as closely as possible by strikes by all other forces once approval was provided by the High Command. If possible, rocket and artillery troops of the ground forces would strike simultaneously (i.e., within minutes) with the strategic rocket forces.”¹⁰⁹ The actual nuclear operation would resemble those conceived in the prior period in that the nuclear strike would be complex, massive, and decisive. According to a declassified Central Intelligence Agency memorandum, Soviet exercises and documents indicated that around 900 to 1,200 tactical nuclear warheads and bombs would be allocated to the ground forces and tactical air forces for use against NATO’s central region. Of these, some 300 to 400 would be used in the initial massive strike, with another 600 or so subsequent nuclear strikes planned in the theater.¹¹⁰ The first nuclear strike would consist of two consecutive salvos, the first o

¹⁰⁶ Joseph D. Douglass, Jr., “Soviet Nuclear in Europe: A Selective Targeting Doctrine?” *Strategic Review* 4, no. 4 (Fall, 1977): 24.

¹⁰⁷ Ibid.

¹⁰⁸ Chervonobab, *op. cit.*, 86.

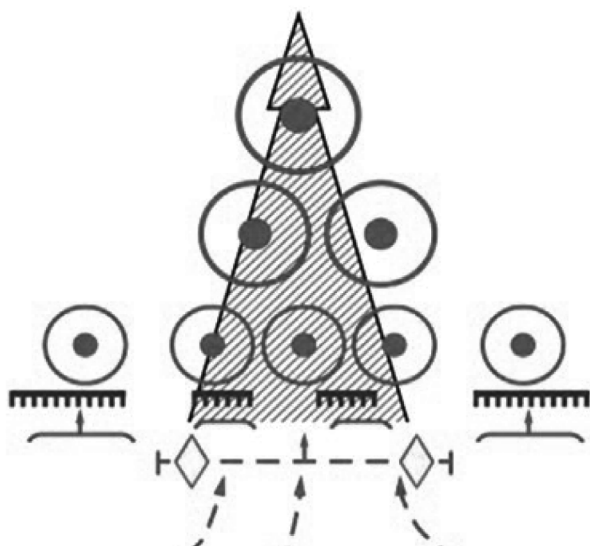
¹⁰⁹ “Soviet Concepts of War in Europe,” *op. cit.*, 12.

¹¹⁰ “Soviet Nuclear Doctrine: Concepts of Intercontinental and Theater War,” Directorate of Intelligence, Central Intelligence Agency, June 1973. Declassified by the CI on December 21, 1993, 23. Another set of classified Soviet documents indicated that the European theater held “about 500 targets,” whose destruction would require “about two thousand strikes.” See “Soviet Concepts of War in Europe,” *op. cit.*, 13.

which would be launched on warning of enemy preparations to use nuclear weapons, and the second of which would come some hours later, if and where key NATO targets had survived the first strike ¹¹¹

Within the nuclear operation itself, a high degree of synchronization was required. In particular, the General Staff coordinated front and strategic targeting by means of a nuclear targeting demarcation line, which would be redrawn as the conflict evolved. By the mid-1970s, the initial demarcation line lay 250 km to the west of the intra-German border.¹¹² Within the first 100 to 200 km of this zone, SCUD missiles would focus primarily on nuclear-related airfields and weapons storage sites ¹¹³ Targets beyond the 250-km line were the responsibility of Strategic Rocket Forces (primarily the SS-4 and SS-5 based in the USSR) and the Long-Range

Aviation. Where necessary, medium- and intermediate-range weapon systems based in the USSR would supplement Soviet tactical nuclear forces within the 250-km line given the latter's range and payload limitations.¹¹⁴



Tactical nuclear strikes would be designed to create gaps in NATO's defenses, disrupt its reserves, and decapitate

Figure 20: Soviet tactics manual showing a tank attack through a gap created by nuclear strikes, represented by the dots. From V.G. Reznicheko, *Tactics*, Office's Library Series (Moscow: Voenizdat, 1966), 79. Found in Lester W. Grau and Charles K. Bartels, *The Russian Way of War* (Fort Leavenworth, KS: Foreign Military Studies Office, 2016), 202

¹¹¹ Heuser, *op. cit.*, 445.

¹¹² "Soviet Planning for Front Nuclear Operations," *op. cit.*, 3.

¹¹³ *Ibid.*, 14.

¹¹⁴ "Evolution of Soviet Concepts and Forces for Nuclear War in Europe," *op. cit.*, i; and "Warsaw Pact Tactical Nuclear Forces in Central Europe" *op. cit.*, 3.

the command structure.¹¹⁵ While frontal aviation bombers and fighters - bombers also would participate in striking fixed targets such as airbases, their principal mission was to locate and destroy mobile targets, neutralize retreating force concentrations, and identify major force groupings and newly activated airbases for subsequent strikes.¹¹⁶ According to classified writings and lectures given to Warsaw Pact officers, Soviet naval forces would begin an almost unlimited use of tactical nuclear weapons after the transition to theater-wide nuclear war. Warsaw Pact lecture notes indicate that their targets would be nuclear weapons platforms at sea (aircraft carriers, SSBNs, and other surface ships) as well as naval facilities, troop concentrations, and airfields.¹¹⁷ Overall, Soviet nuclear strikes would typically be airbursts, with yields ranging on the low end of 3 kilotons to the high end of hundreds of kilotons. In actuality, the Soviets appeared to favor larger yields than would be employed by NATO armies.¹¹⁸

Soviet and Warsaw Pact exercises reflected the new non-nuclear period and its relationship to nuclear operations. Each exercise posited a sudden NATO offensive into Warsaw Pact territory. During the non-nuclear phase, Soviet planners sought to detect evidence of imminent NATO nuclear use. After around three days of combat, NATO was posited to employ nuclear weapons, prompting Soviet nuclear use. While direct comparisons are difficult to re-construct, it does appear that Pact exercises demonstrated improved nuclear coordination over time. For instance, in a 1967 exercise, only 12 of 20 NATO divisions, 3 of 13 surface-to-air missile battalions, and 4 of 14 nuclear munitions depots were destroyed by nuclear strikes given various limitations on the front commander.¹¹⁹ By 1973, however, Soviet planners coordinated their exercise nuclear strikes so efficiently that nuclear-armed aircraft were over NATO targets approximately 10 minutes after strikes by FROG and SCUD missiles.¹²⁰

¹¹⁵ "Evolution of Soviet Concepts," *op. cit.*, 11-12.

¹¹⁶ Douglass, 1976, *op. cit.*, 66-67.

¹¹⁷ "Soviet Naval Strategy: Concepts and Forces for Theater War Against NATO," Intelligence Report, Central Intelligence Agency, January 1975. Declassified by the CIA on June 14, 2017.

¹¹⁸ "Warsaw Pact Politico-Military Strategy and Military Doctrine for the Tactical Use of Nuclear Weapons," *op. cit.*, 15.

¹¹⁹ Glebov, *op. cit.*

¹²⁰ "Soviet Concepts for Employment of Nuclear Weapons in a Conflict with NATO – Evidence from Warsaw Pact Military Exercises," *op. cit.*, 5.

Two important features of Soviet thinking were revealed during such exercises. First, the Soviet Union did not always respond immediately to NATO nuclear employment with theater-wide strikes. During a 1973 General Staff-directed exercise in the western theater, NATO employed five nuclear mines and three nuclear missiles to slow the advance of two Soviet armies. This was recognized as a limited use of nuclear forces, and Warsaw Pact forces did not respond with nuclear strikes of their own, as they were still achieving their objectives. Only with intelligence that NATO was preparing for a massive nuclear use did the Warsaw Pact launch a major and pre-emptive nuclear strike on the fifth day of combat.¹²¹ Another major exercise postulated a NATO incursion deep into East Germany, followed by NATO nuclear employment after three days. The initial Soviet nuclear response was limited, directed only against the deepest point of the incursion. As NATO escalated its use of theater nuclear weapons, the Soviets carried out a massive nuclear attack against it.¹²² While official Soviet doctrine rejected prospects for limited nuclear operations, Soviet military planners and officials began to cautiously explore such possibilities. However, it would only be in the next period of concept development in which limited nuclear options were integrated in earnest.

Second, great attention was paid to the problems of overcoming the effects of nuclear strikes on Warsaw Pact forces. In a command post exercise in 1974, a surprise NATO nuclear strike resulted in 50 percent losses for some Pact units and the virtual destruction of the Soviet Third Shock Army.¹²³ Other exercises similarly witnessed 30 to 50 percent of Pact personnel and equipment lost to nuclear strikes.¹²⁴ While reconstitution took typically around three days (replacing combat ineffective units with those from the second echelon), it was clear that exercises exposed the enormous toll nuclear employment could have on general purpose forces.¹²⁵ According to General M.A. Gareev, who became General of the

¹²¹ Ibid., 6.

¹²² Ibid., 4.

¹²³ Ibid., 8.

¹²⁴ Ibid., 6.

¹²⁵ Ibid., 5.

Army in 1990, the General Staff conducted quantitative analysis in the early 1970s on the effects of battlefield nuclear weapons and found that all significant movement would cease for several days¹²⁶ As noted by Czech Lieutenant General Mojmír Zachariáš, such assessments diverged sharply from the more ambitious assumptions made in the operation plan.¹²⁷

To help mitigate these challenges, Soviet and Warsaw Pact forces were routinely trained to fight on a nuclear battlefield To protect friendly forces, a troop safety line would be established during nuclear strike planning.¹²⁸ The line was not to be crossed until Soviet nuclear strikes had been carried

out.¹²⁹ At the designated time (H-hour), Pact ground forces postured just outside the blast zone would break into the forward edge of battle. In practice, however, H-hour was intended primarily to coordinate the exploitation of a nuclear attack, rather

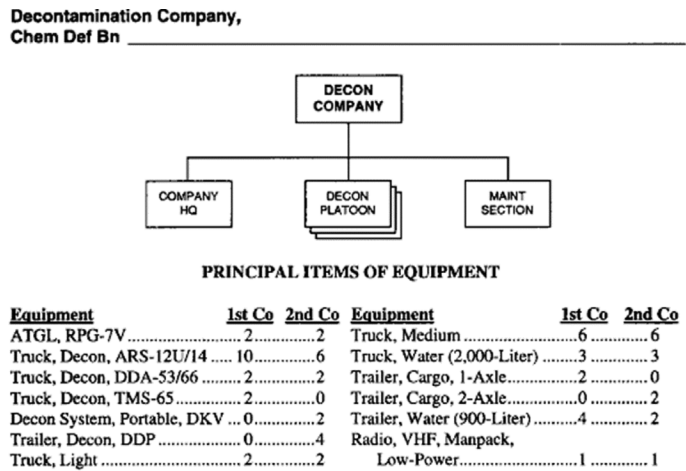


Figure 21: A typical decontamination company of the Chemical Defense Troops. This structure largely remained in place within the Russian military. From Field Manual No. 100-63, Infantry-Based Opposing Force Organization Guide, Headquarters, Department of the Army, April 18, 1996.

than warn friendly troops. Troop warnings were generally limited to nuclear attack operations at night to reduce the potential for temporary blinding.¹³⁰ Communication to friendly forces of an incoming nuclear

¹²⁶ “Interview with Gareev,” *op. cit.*, 74.

¹²⁷ Hoffenarr and Findlay, *op. cit.*, 92.

¹²⁸ Colonel A.A. Sidorenko, *The Offensive* (Moscow, 1970), 142. Translated and Published under the Auspices of the United States Air Force. Also see G.I. Garbuz, D.F. Loza, and I.F. Sazonov, *Motostrelkovyi Batal'on v Boiu* (Moscow: Voenizdat, 1972), 142. Found in Major Richard S. Kosevich, “The BMP-Equipped Motorized Battalion in the Offensive,” U.S. Army Institute for Advanced Russian and East European Studies, December 20, 1977.

¹²⁹ Glebov, *op. cit.*

¹³⁰ Douglass, 1976, *op. cit.*, p. 59.

strike therefore could be limited to perhaps a few minutes. For example, airborne forces might only receive such warning en route to a landing zone.¹³¹ While Pact troops would have little advance notice of friendly nuclear strikes, their commanders would have more forewarning. Again, tight hierarchical control and centralized planning was viewed as a benefit troop commanders would know prior to a conflict which areas would and would not be safe to traverse.

Soviet ground forces were organized for combined nuclear-conventional combat both offensively – with missile and rocket units – and defensively – with the Chemical Defense Troops for radiation demarcation and decontamination.

Training in personnel protection equipment under realistic conditions was also emphasized.¹³² NATO and the U.S. Seventh Army estimated that between 1971 and 1978, “the time spent by Soviet forces training

for warfare on a nuclear battlefield and the amount of equipment devoted to nuclear operations have increased by more than 30 percent.”¹³³ Pact field maneuvers regularly featured prolonged operations by troops wearing protective clothing and equipment.¹³⁴ The use of colored flares would indicate radioactive contamination to troops, who would then quickly apply their respirators, mount their vehicles, and switch on protective systems.¹³⁵ Soviet armored vehicles, such as the BMP-1 infantry fighting vehicle, were designed and equipped specifically to operate in a nuclear

¹³¹ The Soviets attached particular emphasis to airborne and air assault landings behind enemy lines, so such units often participated in nuclear planning. See Colonel Andrushkevich, “The Delivery of Nuclear Strikes in Support of a Large Airborne Landing in a Front Offensive,” *Military Thought*, No. 3, 1967. Declassified by the CI on 13 April 2012. See also, Lieutenant-General V. Reznichenko, “Offensive Operations in a Nuclear Environment,” *Military Thought*, No. 1, January 1972. Translated by Foreign Press Digest and reprinted in *Strategic Review* 9, no. 1 (Winter 1981).

¹³² Major-General G. Ostapchuk, “The Rapid Elimination of the Aftereffects of Enemy Nuclear and Chemical Strikes,” *Military Thought*, no. 1 (86), 1969. Declassified by the CI on May 2, 2015.

¹³³ Major John P. Rose, USA, “The Battlefield Threat: Soviet Concepts, Doctrine, and Strategy,” *Air Defense Magazine*, July-September 1978, 28.

¹³⁴ *Ibid.*, 27.

¹³⁵ C.N. Donnelly, “Winning the NBC War: Soviet Army Theory and Practice,” Selected Readings in Nuclear, Biological, and Chemical Operations, U.S. Army Command and General Staff College, July 1983. Also see Douglass, 1977, *op. cit.*

environment. The modernized T-64A provided a collective protection system that sensed the presence of radiation and immediately sealed large openings into the crew compartment and used the overpressure there to prevent the introduction of contaminated air immediately after detection.¹³⁶ Decontamination vehicles and specialized troops were also present in quantity and operated alongside units during field maneuvers.¹³⁷ These Chemical Defense Troops were tasked with chemical, biological, nuclear, and radiological defense of the Soviet Armed Forces. A chemical battalion was attached to each Soviet army and all armored and motorized rifle divisions. These chemical battalions tended to have sixty-six vehicles, thirty-two of them for decontamination within three companies. Two companies decontaminated vehicles and equipment, the other decontaminated personnel and clothing.¹³⁸

The Soviet approach to reconstitution of losses from nuclear strikes on a unit was also a major advantage over NATO.

Engineering troops similarly would be attached to units to mitigate adverse nuclear effects. In one Soviet journal, the author posited that removal of debris from a roadway would take an engineer platoon 1 to 3 hours to accomplish after an airburst of 30 kilotons, 2 to 3.5 hours following a 300-kiloton airburst, and 3.5

hours after a 300-kiloton surface detonation.¹³⁹ As with other aspects of Soviet planning noted above, these calculations likely were aspirational. Should Warsaw Pact units suffer significant damage, the Soviet plan took a simple approach to reconstitution. In contrast to the United States, rather than replace casualties on an individual basis to bring formations back to full strength, entire units would be replaced from the second wave or echelon.¹⁴⁰

¹³⁶ "Soviet Tank Programs," Central Intelligence Agency, NI IMM 84-10016/DS, December 1, 1984, 11. Declassified by the CI on October 1999.

¹³⁷ Major Donald Mercer, USA, "The Warsaw Pact Short-Warning Nuclear Attack: How Viable an Option?" U.S. Army Russian Institute, May 1, 1979, 29.

¹³⁸ Odom, *op. cit.*, 28. It is important to recognize that Soviet preparations far surpassed similar Western efforts in both quality and quantity. This was often explicitly noted by U.S. analysts.

¹³⁹ Ostapchuk, *op. cit.*

¹⁴⁰ Lieutenant Colonel I. Bukatin, "Shortening the Time Needed to Restore the Combat Effectiveness of Front Troops and Conducting an Offensive with the Forces Remaining after an Initial Nuclear Strike," *Military Thought*, No. 1, 1970. Declassified by the CI on April 19, 2012.

As noted in an American study, “The Soviet Union does not intend to allow heavy losses to halt or significantly slow what they call the ‘tempo of the battle.’ Soviet commanders are taught to include in their operational planning procedures for reconstituting combat effectiveness in contaminated areas or areas of heavy damage from available forces, and to carry on even in the face of heavy losses.”¹⁴¹ To help lessen casualties, Soviet commanders emphasized speed. Simply put, the higher rate of attack, the less time personnel would be exposed to radiation.¹⁴²

This period thus can best be understood as an evolutionary period featuring important refinements which would embolden new thinking in subsequent years. While nuclear conflict remained the dominant feature in Soviet planning, the acceptance of a non-nuclear phase presented new conceptual possibilities about limited forms of warfare that may not necessarily escalate to large-scale nuclear war. This included conflict that remained non-nuclear for its entirety, as well as options for limited nuclear employment. Such concepts were appealing, as Soviet planners came to view large-scale nuclear employment in theater (and globally) as particularly problematic for achieving their strategic and operational objectives. Even as Soviet planners grappled with such concepts, steady emphasis was placed on training troops to operate on a nuclear battlefield regardless of duration.

4. The Pinnacle and Decline of Nuclear-Conventional Synchronization (Mid 1970s-Early 1990s)

The final period of Soviet nuclear-conventional synchronization can be characterized as one of change, reflected in political guidance, military technologies, doctrine, and resource allocation. By the late 1970s, the Soviet General Staff realized that previous concepts for warfare, which emphasized nuclear use, were becoming quickly outdated. It

¹⁴¹ Lieutenant Colonel William P. Baxter, USA (Ret.), “Survival, Fighting-on Stressed in Red Nuclear Defense Doctrine,” *Army Magazine*, July 1981. Ref 67.

¹⁴² V. Ye. Savkin, *The Basic Principles of Operational Art and Tactics (A Soviet View)*, (Moscow: Voenizdat, 1972), found in Douglass, *op. cit.*, 50.

began to assess that a conventional conflict “independent” of nuclear weapons could occur with the United States and NATO. To be sure, the nuclear shadow would be cast over any contingency, but actual nuclear employment generally was considered less likely to occur. This prompted development of new strategies and methods for a conflict in Europe, from non-nuclear to limited nuclear war, a challenge taken up by N.V. Ogarkov, Chief of the General Staff from 1977 to 1984, and other leading military theoreticians in the General Staff.

Two mutually reinforcing developments motivated Soviet doctrinal innovation during this phase. First, Soviet leaders had begun to question the utility of large-scale nuclear employment. In 1977, General Secretary of the Communist Party Leonid Brezhnev made an important speech in the city of Tula, in which he explained that there could be no winners in a nuclear war, largely due to the strategic nuclear parity that now existed between the two sides, which would make certain an overwhelming nuclear blow in any circumstance.¹⁴³ This new political guidance was reinforced by Soviet military elites such as Ogarkov, Defense Minister Dmitri Ustinov, and Chief of the General Staff from 1984 to 1988 S.F. Akhromeev.¹⁴⁴ As noted by Ogarkov, the rapid quantitative growth of nuclear weapons and the qualitative improvement of delivery systems led to a “fundamental reassessment of the role of these weapons, and to a break in previous views on their place and importance in war, on methods of conducting engagements and operations, and even the possibility of waging war at all with the use of nuclear weapons.”¹⁴⁵ In short, it was now recognized that nuclear weapons use would be catastrophic and counterproductive to Soviet combat operations in the European theater. This was a significant shift in Soviet political and military thought which, since Khrushchev, had held that large-scale nuclear war was inevitable and would be ‘won’ by the USSR. Now, Soviet leaders recognized that U.S.

¹⁴³ Christopher S. Wren, “Brezhnev Appeals to Carter on Arms,” *New York Times*, January 19, 1977.

¹⁴⁴ D.F. Ustinov, “Averting the Threat of Nuclear War,” *Pravda*, July 12, 1982, 4. Found in Mary C. FitzGerald, “Marshal Ogarkov on Modern War: 1977-1984,” Center for Naval Analyses, November 1986, 4; Interview with Marshal S.F. Akhromeev, in John G. Hines, Ellis M. Mishulovich, and John F. Shull, *op. cit.*

¹⁴⁵ N.V. Ogarkov, *Istoriya uchit bditel'nosti* (Moscow: Voenizdat, 1985), 51. Found in FitzGerald, *op. cit.*, 20.

and NATO nuclear forces could respond with a devastating second strike. Soviet analysts thus had to consider more carefully how to defeat NATO without either side resorting to nuclear use. This entailed a combination of speedy conventional operations, non-nuclear disruption of NATO nuclear forces and their command and control, and threats to escalate to nuclear use (i.e., Soviet planners never relied exclusively or even heavily on deterrence but rather use of disabling force to deal with NATO's nuclear threat).

Second, technological advances promised to alter the nuclear-conventional relationship. According to the Deputy Chief of the Soviet General Staff M.A. Gareev, "Now we can speak about the turning point in the development of military science and military art. In general, a new qualitative leap in the development of military affairs, connected with the modernization of nuclear weapons and especially the appearance of new types of conventional weapons, is ripening."¹⁴⁶ Indeed, Ogarkov believed that a new *Military-Technical Revolution* was underway in which the latest technologies made it possible to "see and to strike deep" in a future battlefield.¹⁴⁷ These tools and the organizational changes that would accommodate them were believed to be a genuine discontinuity in military affairs rather than evolutionary adaptation.¹⁴⁸ Conventional precision weapons and, in the future, long-range and accurate reconnaissance-strike systems were at the heart of this "qualitative leap."¹⁴⁹ These weapons used in mass could, according to Soviet analysts, accomplish many of the tasks formerly assigned to nuclear weapons and approximate their effectiveness.

Soviet analysts perceived that they were being outpaced by Western conceptual innovations that sought to harness these advanced technologies. As Akhromeev observed, the "inevitability of a retaliatory nuclear strike and its catastrophic consequences" convinced the United States and

¹⁴⁶ M.V. Gareev, *Voyennyy Teoretik* (Moscow: Voenizdat, 1985), 438. Found in Jacob W. Kipp, "Confronting the RMA in Russia," *Military Review*, June-July 1997.

¹⁴⁷ Dima Adamsky, *The Culture of Military Innovation* (Stanford, CA: Stanford University Press, 2010), 27.

¹⁴⁸ Ibid.

¹⁴⁹ Colonel-General M.A. Gareev, "The Creative Nature of Soviet Military Science in the Great Patriotic War," *Voyenno-istoricheskiy zhurnal*, No. 2, 1984, 29. Found in FitzGerald, *op. cit.*, 57

NATO to concentrate on developing advanced concepts and conventional weapons.¹⁵⁰ Soviet analysts saw in the new U.S. AirLand Battle and NATO Follow-on Forces Attack concepts the potential defeat of their doctrine by disorganizing and destroying the vital second echelon forces using precision conventional weapons.¹⁵¹ Soviet analysts believed that such technologies would be far more efficient than nuclear weapons in this regard. In the late 1970s, military elites such as Ustinov and Ogarkov explicitly called for the Warsaw Pact to acquire completely new conventional weapons systems and conceptual methods for their employment to counter NATO's growing superiority in such technologies and strategies.¹⁵²

The confluence of these factors accelerated the need to pursue new methods for armed conflict. Given his position, Ogarkov proved to be the most forceful and provocative in driving this innovation, insisting that, "bold experiments and solutions are necessary, even if this means discarding obsolete traditions, views, and propositions."¹⁵³ According to Gareev, those "obsolete" elements could largely be found in the central propositions from Sokolovskiy's *Military Strategy*, given the reality of nuclear-missile parity.¹⁵⁴ New Soviet thinking held current reliance on nuclear forces as "absurd" given the devastating consequences nuclear employment would entail.¹⁵⁵ Instead, conventional warfare promised to be more stable and controllable, and therefore more practical. Indeed, Ogarkov called for greater attention to preparing for a war that would employ solely conventional means of destruction.¹⁵⁶

¹⁵⁰ S. Akhromeev, "The Superiority of Soviet Military Science and Soviet Military Art as One of the Most Important Factors of Victory in the Great Patriotic War," *Kommunist*, No. 3, 1985, 62. Found in FitzGerald, *op. cit.*, 54-55.

¹⁵¹ Adamsky, *op. cit.*, 26.

¹⁵² "Document No. 81: Marshal Ogarkov Analysis of the 'Zapad' Exercise, May 30-June 9, 1977," in Vojtech Mastny and Malcolm Byrne, eds., *A Cardboard Castle? An Inside History of the Warsaw Pact, 1953-1991* (Budapest, Hungary: Central European University Press, 2005), 406.

¹⁵³ N.V. Ogarkov, "A Reliable Defense to Peace," *Izvestiya*, May 9, 1983, 2. Found in Mary C. FitzGerald, "Marshal Ogarkov on the Modern Theater Operation," *Naval War College Review*, 39, no. 4 (Autumn 1986): 41.

¹⁵⁴ Colonel-General M.A. Gareev, *M.V. Frunze – voyennyy teoretik* (Moscow: Voenizdat, 1985), 239. Found in FitzGerald, 1986, *op. cit.*, 40.

¹⁵⁵ Ogarkov, 1985, *op. cit.*, 88. Found in FitzGerald, 1986, *op. cit.*, 57.

¹⁵⁶ Adamsky, *op. cit.*, 29.

Soviet military planners had to reconcile the new emphasis on conventional warfare with certain nuclear realities. They did so by two principal means – adjusting force posture for greater nuclear-conventional flexibility, and devising new operational concepts to defeat NATO strategy. While AirLand Battle and other innovations highlighted the growing importance of the conventional battlespace, potential U.S. nuclear employment to offset the Warsaw Pact's numerical conventional superiority remained a top Soviet concern. To discourage NATO nuclear use, the Soviet Union sought overmatch in theater nuclear systems, too. Principally, this advantage was based on the new SS-20 IRBM. The SS-20 was a solid-fueled, two-stage, mobile missile equipped with three independently targetable re-entry vehicles that replaced the older, less capable SS-4 MRBMs and SS-5 IRBMs, which were liquid fueled and equipped with a single warhead each. According to General Colonel A.A. Danilevich, the deployment of the SS-20 was “a breakthrough, unlike anything the Americans had. We were immediately able to hold all of Europe hostage.”¹⁵⁷ By 1986, the Soviet Union had deployed at least 441 SS-20 launchers with around 1,323 nuclear warheads.¹⁵⁸

Modernization also included short-range ballistic missiles (e.g., SS-21, SS-22, and SS-23), Fencer and Flogger medium-range fighter-bombers, and the medium-range Backfire bomber. While Khrushchev had discouraged nuclear artillery, the USSR likewise made a major investment in dual-capable artillery at this time. Taken collectively, Soviet analysts believed they had achieved nuclear superiority, or at least as close to superiority as achievable.¹⁵⁹ As noted by American expert James McConnell, the central Soviet emphasis was on a strong theater nuclear posture, “not so much as a fallback, but for inhibiting NATO's recourse to the nuclear route to redress the imbalance at the conventional level.”¹⁶⁰ This confidence, in

¹⁵⁷ Ibid.

¹⁵⁸ *Soviet Military Power*, Department of Defense, 1986, 36-37.

¹⁵⁹ Hines, et.al., *op. cit.*, 12.

¹⁶⁰ James M. McConnell, “The Soviet Shift in Emphasis from Nuclear to Conventional: The Mid-Term Perspective,” Center for Naval Analysis Report, June 1983, 35.

part, probably emboldened Brezhnev to adopt a No-First Use pledge to the United Nations General Assembly in 1982.¹⁶¹

The development of these systems provided important practical benefits to nuclear warfighting should it become necessary. This was not incidental, since the Soviets designed their weapons to fulfill specific wartime tasks.¹⁶² For example, tube artillery now afforded a more responsive and accurate means of delivering lower-yield warheads than was possible with the older FROG-7, SCUD-B, and SS-12 missiles. This meant greater maneuverability for Soviet ground forces on a nuclear battlefield.¹⁶³

Modernization also opened up new possibilities to trade-off nuclear and conventional missions. The newer SS-21, SS-22, and SS-23 missiles were more accurate than their predecessors and gave the Soviets their first true, dual-capable battlefield missiles.¹⁶⁴ By shifting more of the frontline nuclear mission to tube artillery, some portion of these missiles could be freed up for conventional missions. Nuclear artillery could likewise reduce the number of strike aircraft withheld for theater nuclear contingencies, reversing the trend of increased Soviet reliance on aircraft for such purposes.¹⁶⁵ The numbers involved were significant. A now-declassified CIA assessment from 1979 noted that one-fourth of Warsaw Pact tactical aircraft and one-fourth to one-third of naval aircraft would likely be withheld for nuclear missions.¹⁶⁶ Around this time, the CIA estimated

¹⁶¹ At the time, Brezhnev's gesture was seen in the West as a ploy to disrupt NATO deployment of Pershing IIs and GLCMs and was not taken seriously. See Serge Schmemmann, "Russia Drops Pledge of No First Use of Atom Arms," *New York Times*, November 4, 1993.

¹⁶² Danilevich Interview, *op. cit.*

¹⁶³ "Soviet Short-Range Ballistic Missiles and the Impact of a Ban on Long-Range INF Missiles," *op. cit.*, 3.

¹⁶⁴ *Ibid.*, 7. Also see Heuser, *op. cit.*

¹⁶⁵ "Soviet Planning for Front Nuclear Operations in Central Europe," *op. cit.*, 14. Importantly, the CIA assessed in a now declassified report that the tactical air nuclear strike capability could be limited by the fact that only approximately one-half of the Pact pilots were trained for nuclear weapons delivery. Also see "Warsaw Pact Forces Opposite NATO: National Intelligence Estimate," Central Intelligence Agency, Vol. I, NIE 11-14-81D, January 1982, 20-21. Declassified by the CIA in June 2004.

¹⁶⁶ *Ibid.*, 75-76.

that potentially half of the Pact's initial nuclear strike could be delivered by aircraft.¹⁶⁷ With nuclear artillery fulfilling the close support nuclear mission, these numbers could be reduced in favor of conventional air superiority, counter-nuclear, and air defense suppression missions.¹⁶⁸

Finally, the deployment of cruise missiles provided another means of covering the nuclear target set despite the increased emphasis on conventional warfare. In the 1980s, the Soviets began to deploy the nuclear-armed SS-N-21 sea-launched cruise missile along with its ground- and air-launched variants. These weapons provided additional forces to strike battlefield targets as well as complement the SS-20 deep strike mission. Interestingly, the Soviets may also have viewed deployment of the SS-N-21 aboard submarines off U.S. shores as a means to hold the U.S. homeland at risk with a "theater" system; this to repudiate any belief that U.S. theater nuclear forces could strike the Soviet homeland and keep a conflict limited to Europe.¹⁶⁹ Yankee-, Golf-, and Hotel-class SSBNs likely were also assigned to strike theater targets, such as ports.¹⁷⁰

The other means of adaptation was to re-conceptualize the battlespace. Ogarkov envisioned a highly fluid and expansive battlefield in which the primary means of combat were qualitatively new conventional weapons and means of employment. This included the Theater Strategic Operation, the concept of operational maneuver groups (OMG), and reconnaissance-strike complexes. For the Theater Strategic Operation and OMGs, the Soviet General Staff turned to previous theories and experiences from 1920-1945. The Theater Strategic Operation essentially promoted

¹⁶⁷ "Soviet Planning for Front Nuclear Operations in Central Europe," *op. cit.*

¹⁶⁸ See "The Soviet Operational Maneuvers Group: An Intelligence Assessment," Central Intelligence Agency, November 1983. Declassified by the CIA in 1999.

¹⁶⁹ Jerome J. Burke, "Analogous Response Redux: Vladimir Putin's Aspirations for Altering the Maritime Balance," Institute for Defense Analyses, June 2020, 22-23. The latter appears to be reflected in Ogarkov's ominous warning following the NATO decision to modernize its theater nuclear forces. According to Ogarkov, nuclear-armed sea-launched cruise missiles provided "adequate in range, in yield, in accuracy, and what is especially important, in flight time to their targets."

¹⁷⁰ "Warsaw Pact Forces Opposite of NATO," *op. cit.*, 76; *Soviet Military Power*, Fourth Addition, Department of Defense, 1985, 31-32, and R.O. Welander, et al., *The Soviet Navy Declaratory Doctrine for Theater Nuclear Warfare* (Washington, DC: BDM Corporation, 1977), 41.

longstanding Soviet thinking: strike across the entire depth of an enemy, penetrating defenses and establishing a rapid pace for swift operational success.¹⁷¹ The OMG concept helped attain these goals. OMGs – an independent combined-arms armored division with organic air support – would penetrate ruptures in the line of contact to destroy or seize key objectives such as NATO’s nuclear forces, command and control, and logistics before NATO could fully mobilize, as well as pave the way for follow-on Pact forces. Massive conventional air operations would substitute for an initial large-scale nuclear strike against military targets, as well as provide air supremacy through counter-air operations.¹⁷² This would also include airborne landings at critical sites throughout the entire operational depth.

The OMG concept enabled Warsaw Pact planners to frustrate the two pillars of NATO’s strategy: deep interdiction of second echelon forces and flexible nuclear response. To thwart NATO interdiction as envisioned under AirLand Battle and Follow-on Forces Attack, OMGs would be committed much earlier than the second echelon. The resulting rapid penetration and deep exploitation of NATO lines would generate operational shock and paralyze Western decision-making, allowing Pact forces to achieve their aims before NATO could reach a decision to use nuclear weapons. Moreover, the confused battlespace, wherein there was no clearly discernable front line and both sides’ forces were co-mingled at depth, would prohibit NATO nuclear use even if a decision was reached. As noted by V.G. Reznichenko, “The continuous conduct of battle at a high tempo creates unfavorable conditions for enemy use of weapons of mass destruction. He cannot determine targets for nuclear strikes exactly and, besides, will be forced to shift his nuclear delivery means often.”¹⁷³ This expansion of the anti-atomic maneuver concept was considered a partial remedy to countering high precision conventional weaponry, as well.

¹⁷¹ Adamsky, *op. cit.*, 34.

¹⁷² Heuser, *op. cit.*

¹⁷³ V.G. Reznichenko, *Tactics* (Moscow: Voenizdat, 1987), 18.

OMG success would hinge upon long-range fire support as it plunged deeper into enemy territory. As noted by Israeli expert Dima Adamsky, “To execute such an operation successfully, the military had to be able to achieve deep targeting within the theater, so that ground forces would be able to rely on theater fire support to the full depth of their deployment.”¹⁷⁴ This was to be provided by the reconnaissance-strike and fire “complex,” that is, the means of reconnaissance, high-precision fire support, and command and control consolidated into a single network.¹⁷⁵ By the early 1980s, Warsaw Pact officers were well versed in such coordination. Aircraft such as the MiG-25 and the Su-17 and satellites provided extensive advanced reconnaissance, which was relayed to command centers for strikes.¹⁷⁶ A Voroshilov General Staff Academy lecture described how such concepts could be operationalized at the front level:

The AN72R reconnaissance aircraft patrols or conducts reconnaissance at a distance of 100-150 km from the forward edge of the battle area. The data obtained by the aircraft can be relayed and transmitted to a ground control center and from there to weapons, i.e., fighter-bomber aircraft or to a missile battalion. We have missiles which are specially designed for this complex, and the kill range is 110 km plus the operational radius of the aircraft. In general the aircraft can [deliver a missile] to a distance of 500-600 km, that is, to the depth of reconnaissance.¹⁷⁷

While these initial steps were promising, other factors impeded full implementation of the reconnaissance-strike and fire complex: namely, a deepening rift between Defense Minister Ustinov and Ogarkov (the latter would be removed from his post in 1984) and the onset of Mikhail Gorbachev’s political, economic, and military reforms, which undercut bureaucratic willingness to support the necessary forces. Though the Soviet Union never fully realized Ogarkov’s vision for a *Military-Technical Revolution*, his conceptualizations laid the groundwork for future Russian advancements that materialized in the 2010s.

¹⁷⁴ Adamsky, *op. cit.*, 34.

¹⁷⁵ *Ibid.*, 34-35.

¹⁷⁶ “Soviet Planning for Front Nuclear Operations in Central Europe,” *op. cit.*, 21.

¹⁷⁷ “USSR General Staff Academy Lesson: Rocket Troops and Artillery in a Front Offensive Operation,” Central Intelligence Agency, May 24, 1988. Declassified by the CIA on May 14, 2015.

Despite the emphasis on non-nuclear concepts at this time, Soviet planning for theater nuclear use did not end but rather adapted to new realities and possibilities. Publicly, the Soviet military opposed the notion of a nuclear war limited to Europe. According to Akhromeev, “a so-called limited nuclear war is impossible. If it breaks out, it will be a general war, with all of the ensuing consequences.”¹⁷⁸ His warning may have been part of a broader influence campaign. According to American analyst Raymond Garthoff:

[A]part from probably reflecting a genuine Soviet concern over escalation, this authoritative public declaratory stance clearly has been directed at dissuading U.S. leaders from contemplating limited nuclear warfare as an option, rather than at pursuing such an option themselves. The Soviet leaders have been quite prepared to forego the option of threatening a Eurostrategic war as a price for reducing Western interest in such an option.¹⁷⁹

In fact, Soviet thought leaders were busy developing limited nuclear employment concepts. Voroshilov lectures in the mid-1970s addressed the subject, for example. One lecturer stated, “a war between a number of capitalist and socialist nations can be initiated with the use of conventional weapons, only to later develop into war with the limited employment of nuclear weapons.” Another lecturer explained the underlying rationale for limitation, namely, “political reasons may affect the selection of areas within a theater of military operations, the selection of countries to be hit by nuclear strikes, or of nations not to be attacked or to be attacked temporarily by nuclear weapons.”¹⁸⁰

After the Cold War ended, General A.A. Danilevich acknowledged that General Staff plans to retaliate with nuclear weapons only against Europe existed. This was known as “dosage” or limited employment based on a particular situation. Danilevich explained that if NATO attacked with a limited number of nuclear weapons on specific targets, the leadership might decide to also limit its response, though the best

¹⁷⁸ V. Kondrashov and V. Mikheev, “Responsibility for the Future,” *Izvestiya*, May 19, 1983, 1-2. Found in FitzGerald, 1986, *op. cit.*, 23.

¹⁷⁹ Raymond L. Garthoff, “The Soviet SS-20 Decision,” *Survival*, May-June 1983, 113.

¹⁸⁰ Warner, *op. cit.*, 31.

Despite the emphasis on non-nuclear concepts at this time, Soviet planning for theater nuclear use did not end but rather adapted to new realities and possibilities.

option was considered by the General Staff to be an equal number of strikes against similar targets.¹⁸¹ Such limited employment planning was conducted by a very narrow circle, perhaps akin to contingency planning in U.S. terms. In the CIA's view at the time, "Both doctrine and exercises indicate that these limited nuclear operations represent only a minor variant in the

Soviets' basic plans for war in Europe."¹⁸² Danilevich confirmed this assessment when he explained in the mid-1990s that limited nuclear options were worked out in detail but were not incorporated into actual war plans.¹⁸³ In part, this is due to the fact that the Politburo did not examine nuclear use contingencies frequently. After 1972, the political leadership reportedly did not participate in even a single military exercise involving nuclear weapons, leaving the General Staff to develop scenarios and concepts for nuclear war.¹⁸⁴

Limited nuclear options presented additional challenges to planning, such as ensuring the safety of friendly forces. This and other issues deepened divisions within the Soviet General Staff on the idea of limited nuclear employment.¹⁸⁵ For example, General-Major R. Simonyan noted, "The assertion made by supporters of 'limited' nuclear war that it could be kept within pre-planned limits and made 'controllable,' is altogether false."¹⁸⁶ Ogarkov also remained decidedly against limited nuclear options during his tenure, which helped constrain their use for coercive pressure, political symbolism, or tacit bargaining.¹⁸⁷

¹⁸¹ Danilevich Interview, *op. cit.*, 59.

¹⁸² "Soviet Planning for Front Nuclear Operations in Central Europe," *op. cit.*, 3.

¹⁸³ Danilevich Interview, *op. cit.*, 65.

¹⁸⁴ *Ibid.*, 69.

¹⁸⁵ Batenin Interview, *op. cit.*, 8.

¹⁸⁶ General-Major R. Simonyan, "The Concept of 'Selective Targeting,'" *Red Star*, September 28, 1976. Reprinted and translated in *Strategic Review* 5, no. 2 (Spring 1977).

¹⁸⁷ Warner, *op. cit.*, 19.

While the General Staff may have been split on the viability and relevancy of limited nuclear war, planning for it proceeded.¹⁸⁸ Using terms that harkened back to the 1960s, Soviet analysts continued to stress the integrated nature of a nuclear battlefield, in which nuclear and non-nuclear operations would provide mutually supportive effects. As noted in a 1985 lesson prepared for use in the Voroshilov General Staff Academy:

[N]uclear strikes against an enemy missile grouping, against base airfield of the enemy’s strategic and tactical aviation, and against his air defense means delivered by the strategic rocket forces and long range aviation can interdict or substantially blunt the enemy’s nuclear strikes, alter the balance of theater forces and means to our advantage, and thereby exert a positive influence on the success in the tasks to be dealt with by the ground forces on various axes.... This applies in equal measure to the ground forces, whose successful conduct of operations will have a positive effect on the actions of formations and large units of all the other branches of the armed forces.¹⁸⁹

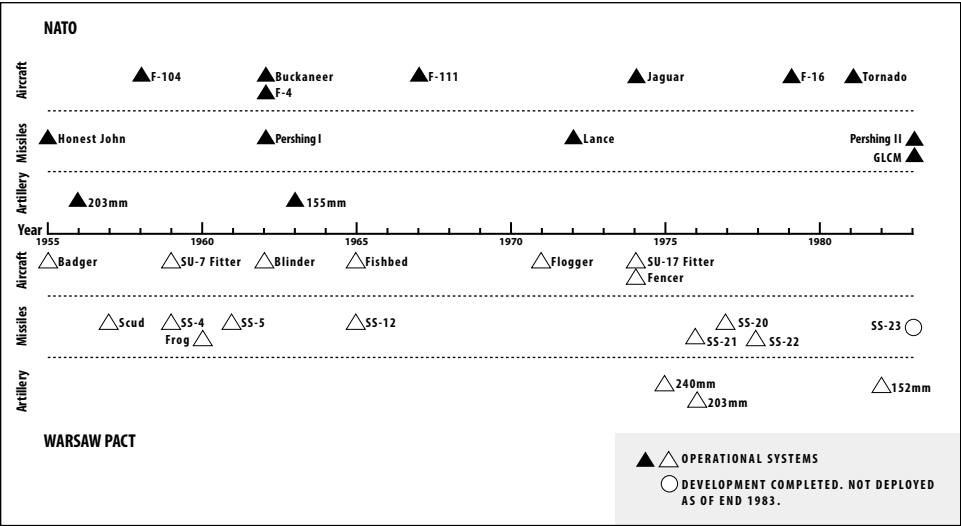


Figure 22: NATO and Warsaw Pact theater nuclear-capable force modernization, 1955-1983. From *NATO and the Warsaw Pact 1984: Force Comparisons*, NATO Archives.

¹⁸⁸ “Soviet Short-Range Ballistic Missiles,” *op. cit.*, 3.

¹⁸⁹ “USSR General Staff Academy Lesson: Ground-Forces,” Central Intelligence Agency, October 21, 1987. Declassified on May 14, 2015

Thus, as late as the mid-1980s, the Western Theater of Military Operations was still planning for some 800 to 1,000 nuclear warheads to be allocated.¹⁹⁰ The Voroshilov General Staff lesson further explained that front rocket and artillery troops would typically employ around 50 percent of the total number of nuclear munitions assigned to them.¹⁹¹ NATO target destruction criteria was precisely defined.¹⁹² A Lance missile battalion would require approximately three nuclear warheads, while twelve to fifteen warheads would strike a division in the second echelon.¹⁹³

That said, greater attention was paid to reducing the overall number of nuclear weapons detonated on the battlefield.¹⁹⁴ According to one declassified CI analysis, “Authoritative Soviet writings calculate that a front’s area of operations will contain about 1,000 reconnaissance targets and that some 350 of these will be of high value – suitable for attack by the front’s nuclear weapons,” a decrease from numbers previously considered.¹⁹⁵ As noted earlier, the 1961 Buria command post exercise postulated the use of 1,600 front and army-level nuclear weapons. The levels of destruction in Central Europe from limited nuclear use would have been horrid nonetheless, in part because Soviet nuclear warhead yields remained high. On the one hand, a 1977 General Staff Academy lesson employed relatively lower-yields at the tactical (i.e., division) level, including 3-, and 10-kt weapons. On the other hand, it still included 20-kt yields. Moreover, yields at the operational-strategic (i.e., front and army) level started at 20 kt and went up to 40 and 100 kt.¹⁹⁶ From the perspective of the CIA, it seemed that the Soviets were wedded to a targeting philosophy that minimized the number of missiles or aircraft

¹⁹⁰ “USSR General Staff Academy Lesson: Soviet Operational Art,” Central Intelligence Agency, July 29, 1988. Declassified by the CI on May 14, 2015.

¹⁹¹ “USSR General Staff Academy Lesson: Rocket Troops and Artillery in a Front Offensive Operation,” Central Intelligence Agency, May 24, 1988. Declassified by the CI on May 14, 2015.

¹⁹² Ibid.

¹⁹³ Ibid.

¹⁹⁴ Hoffenaar and Findlay, *op. cit.*, 139.

¹⁹⁵ “Warsaw Pact Tactical Forces: Capabilities and Readiness for Nuclear War,” *op. cit.*, 5.

¹⁹⁶ “USSR General Staff Academy Lessons: Control of Rocket Troops and Artillery During Preparation and Delivery of the Initial Nuclear Strike in the Course of an Offensive Operations,” Central Intelligence Agency, March 20, 1981. Declassified by the CI on June 18, 2012.

assigned to a target but compensated with large-yield warheads to satisfy damage goals.¹⁹⁷ This seems to have been driven by low confidence in aircraft delivery and missile accuracy. An inflexible command and control system geared to widespread nuclear use posed another impediment to limited nuclear operations.¹⁹⁸

While the General Staff may have been split on the viability and relevancy of limited nuclear war, planning for it proceeded.

As noted earlier, however, the Soviets were just beginning to field more accurate short-range missiles in the early to mid-1980s.¹⁹⁹ These dual-capable systems enabled not only more precise conventional options but also more selective nuclear targeting

plans.²⁰⁰ Akhromeev explained that also by this time, the Soviet General Staff had put in place strong command and control arrangements to prevent unauthorized use of tactical nuclear weapons.²⁰¹ The overall trend was toward more controlled and precise application of force.

Soviet and Pact training and exercises reflected movement toward strictly non-nuclear operations, as well as the potential for escalation to nuclear employment. This was consistent with past practice whereby forces exercised not only in accordance with actual war plans, but also to test new operational concepts.²⁰² In the beginning of this period, preference was still given to large-scale nuclear strike operations, as demonstrated in the YUG-78, BRATSKO PO ORUZHIIYU-80, and YUG-82 exercises. Preemptive nuclear strikes (or retaliatory-meeting strikes in which Soviet weapons would essentially launch-on-warning of attack) were still planned and exercised until at least 1982.²⁰³ More selective nuclear employment

¹⁹⁷ "Soviet Planning for Front Nuclear Operations in Central Europe," *op. cit.*, 18.

¹⁹⁸ Akhromeev Interview, *op. cit.*

¹⁹⁹ "Warsaw Pact Forces Opposite of NATO," *op. cit.*, 76.

²⁰⁰ Hoffenaar and Findlay, *op. cit.*, 152.

²⁰¹ Akhromeev Interview, *op. cit.*

²⁰² Gareev Interview, *op. cit.*, 74.

²⁰³ Heuser, *op. cit.*, 446.

was introduced in SOYUZ-81, which explored a “selective, gradually increasing (in relation to means and targets) use of nuclear weapons by both sides,” commencing with limited nuclear artillery strikes against targets in the tactical depth.²⁰⁴ Beginning in 1982, non-nuclear scenarios start to make their way into Soviet and Pact exercises.²⁰⁵

Theater Strategic Operations and OMGs were tested in both the ZAPAD-81 and SOYUZ-83 exercises. ZAPAD-81 was a two-sided field exercise, reportedly the largest since World War II and involved Soviet forces only, with the commitment of a division-size OMG.²⁰⁶ SOYUZ-83 was a command post exercise, which simulated a three-division-strong OMG following up and then moving through the lead armies of a first-echelon front into the depth of NATO’s Northern Army Group (NORTHAG) in northern West Germany.²⁰⁷ The front was equipped with only 35 nuclear weapons, which underscored the decreasing reliance on nuclear weapons.²⁰⁸ Nonetheless, both ZAPAD-81 and SOYUZ-83 eventually resulted in large-scale nuclear employment by both sides. This may well have reflected deeply ingrained habits rather than a vote of no confidence in the new, non-nuclear concepts. Indeed, SOYUZ-83 appeared to represent the pinnacle of Soviet efforts to operationalize Ogarkov’s *Military-Technical Revolution* and master nuclear-conventional synchronization.²⁰⁹ As noted by SACEUR General Bernard W. Rogers in the early 1980s, “NATO has now been surpassed – or soon will be – in all categories of forces necessary to implement its strategy: strategic nuclear, theater nuclear, and conventional.”²¹⁰

²⁰⁴ Ibid.

²⁰⁵ Importantly, all Warsaw Pact and Soviet plans and exercises assumed NATO first nuclear employment. The Soviets would not employ nuclear weapons first, though preparation of an imminent NATO nuclear attack or a retaliatory-meeting strike (simultaneous to NATO) were not considered first use.

²⁰⁶ “Comments on Exercise ‘ZAPAD-81,’” Central Intelligence Agency, September 18, 1981, 4. Declassified by the CIA on August 18, 2008.

²⁰⁷ Diego A. Ruiz Palmer, “The NATO-Warsaw Pact Competition in the 1970s and 1980s: A Revolution in Military Affairs in the Making or the End of a Strategic Age?” *Cold War History* 14, no. 4 (2014): 551.

²⁰⁸ Heuser, *op. cit.*, 446.

²⁰⁹ Beatrice Heuser, “Victory in a Nuclear War: A Comparison of NATO and WTO War Aims and Strategies,” *Comparative European History* 7, no. 3 (1998): 311–327.

²¹⁰ Testimony of General Bernard W. Rogers, SACEUR, before the House Armed Services Committee, reprinted in *Soviet Aerospace* 30, no. 8 (March 2, 1981).

Ultimately, these advances in Soviet military art would be short-lived. In 1985, Mikhail Gorbachev became the General Secretary of the Communist Party, ushering in a new period of reform, which quickly unraveled the General Staff's integrated approach. Gorbachev sought to reduce military spending and embrace a new, defensive doctrine.²¹¹ The greatest blow to Soviet doctrine was the 1987 INF Treaty. The treaty eliminated an entire class of nuclear forces – ground-based intermediate-range ballistic and cruise missiles. Under the treaty, the Soviet Union destroyed some 889 intermediate-range missiles and 957 shorter-range missiles, to include the SS-20 and SS-23, respectively.²¹² This essentially stripped the General Staff of its foundational means to execute its preferred doctrine. As noted by Soviet Lieutenant General Batenin:

There was a certain irony in that by 1987, many in the General Staff thought that all of the components necessary for conducting deep operations were in place at last, that we were ready that spring. We conducted games and exercises. At the same time, in December of that year we signed the INF Treaty. Gorbachev had his agenda and the General Staff its agenda.... [Gorbachev] was moving in another direction, eliminating the weapons that were the basis for executing such a strategy.²¹³

The Soviet General Staff then was compelled to form a new defensive doctrine that altered its fundamental approach to conflict as well as its goals and objectives. In 1988, then-Chief of the General Staff Akhromeev spoke on the sudden reorientation of Soviet military doctrine to the Polish General Staff. He explained that, “the [new] defensive nature of our military doctrine also has a significant influence on the manner of deploying all types of armed forces in the initial phase of an operation and

²¹¹ See John G. Hines and Donald Mahoney, *Defense and Counteroffensive under the New Soviet Military Doctrine* (Santa Monica, CA: RAND, 1991).

²¹² The SS-20 provided a more robust, mobile, and accurate strike system that had less cumbersome support elements than its predecessors. As such, the SS-20 offered improved ability to evade NATO counter-missile strikes while maintaining options against NATO deep targets.

²¹³ Batenin Interview, *op. cit.*, 7. Emphasis added.

throughout the operational system.”²¹⁴ Consequently, the General Staff would devote 50 percent of its 1988 training cycle to the defensive.

Nuclear employment concepts, too, began to reflect a defensive orientation. For example, while some thought had been given to nuclear landmines to protect vulnerable flanks during the offensive,²¹⁵ greater emphasis now was placed on incorporating such capabilities within defensive belts.²¹⁶ A command post exercise in 1989 featured only limited use of tactical nuclear weapons in eastern Schleswig-Holstein to repel invading forces, compared to previous scenarios that rehearsed massive use of nuclear weapons to seize much of Europe.²¹⁷

To be sure, the offensive “spirit” never truly dissipated from Soviet thinking. Throughout the 1980s, the General Staff recognized that in a Theater Strategic Operation, offensive and defensive activities would operate simultaneously, integrated to achieve overarching strategic results. Yet the foundational shift in political guidance essentially shelved the types of large-scale counter-offensive operations the Soviet General Staff had long planned. Reduced manpower and resources further undercut the more experimental concepts proposed by Ogarkov. Thus, the Soviet military settled into a strategic malaise that remained until the end of the Cold War and the fall of the USSR itself.

²¹⁴ “Lecture by Sergei Akhromeev, ‘The Current State of Soviet Military Doctrine,’” April 14, 1988, History and Public Policy Program Digital Archive, Institute of National Remembrance. Translated for CWIHP from the original Polish by Jaroslaw Garlinski.

²¹⁵ “USSR General Staff Academy Lesson: Rocket Troops and Artillery in a Front Offensive Operation,” *op. cit.*

²¹⁶ Danilevich Interview, *op. cit.*, 65.

²¹⁷ Mark Kramer, “Warsaw Pact Military Planning in Central Europe: Revelations from the East German Archives,” *Cold War International History Project Bulletin*, No. 2, Fall 1992.

Assessing the Soviet Union's Cold War Approach to Nuclear-Conventional Synchronization

Across these four phases spanning the 1940s to 1990s, what did the Soviet Union manage to accomplish in terms of nuclear and conventional synchronization? What gaps remained as the Cold War ended?

Nuclear-Conventional Synchronization Accomplishments

After some wide swings of the nuclear weapons pendulum – from being inconsequential under Stalin, to making conventional weapons obsolete under Khrushchev – the Soviet military not only found balance, but also coherence in synchronizing nuclear and conventional strategy and planning. The notion of the two working in mutual support was aptly appreciated by high-ranking thought leaders such as Marshals Zhukov and Sokolovsky and remained foundational until the final days of the Soviet Union. As noted by A.A. Grechko, Soviet Minister of Defense of the Soviet Union from 1967 to 1976, “The art of conducting military operations with the use of nuclear weapons and that of employing conventional forces have many fundamental differences. But they are not in opposition, are not mutually exclusive, and are not isolated one from the other; on the contrary, they are closely correlated and are developing as a single body.”²¹⁸ The Soviet Union comprehended that any crisis or conflict with the United States would inherently be a nuclear environment – even if nuclear weapons were not employed. Conceptualizing the appropriate relationship between conventional and nuclear forces and operationalizing those concepts were the most important tasks for Soviet military leaders, as they underpinned the entire Soviet approach to conflict with a nuclear-armed peer adversary.

²¹⁸ A.A. Grechko, *On Guard for Peace and the Building of Communism*, Joint Publication Research Service, December 2, 1971, 51-52.



Figure 23: A Soviet TMS-65 decontamination vehicle equipped with an aircraft turbo-jet engine modified to spray decontamination solution. The TMS-65 was normally employed in pairs, positioned on both sides of a road. A contaminated vehicle passing between them could be decontaminated in less than a minute. Photo Credit: U.S. National Archives Catalog.

Underscoring Soviet success in this regard, key synchronization concepts were codified in doctrine, developed into plans, and routinely exercised.

While Soviet views on the use of theater nuclear weapons differed from the West in several regards, with the former's emphasis on preemptive damage limitation, they were logically coherent, and the command and control architecture was consistent with them. Soviet ground forces were organized for combined nuclear-conventional combat both offensively – with missile and rocket units – and defensively – with the Chemical Defense Troops for radiation demarcation and decontamination. By the late 1980s, the Chemical Defense Troops numbered around 80,000 to 100,000 personnel.

Soviet troop training for the nuclear-conventional battlefield was rigorous and sustained. Nuclear munitions were mass-produced, and CBRN protection systems were built into armored vehicle designs – beginning from sandbags at the bottom of tanks in the late 1950s to sophisticated protective over-pressure and filtration systems – something NATO's armored vehicles lacked for most of the Cold War. Such protective equipment and specialized units further strengthened the ability of the Soviet military to operate on a nuclear battlefield. Indeed, the Soviet military did not face a nuclear/conventional choice, but rather planned to prevail under the harshest conditions.²¹⁹ As explained by an American expert:

Whereas Western formations are designed for operations on the conventional battlefield Soviet units are clearly designed for the opposite. In other words, there is a fundamental difference in the

²¹⁹ Odom, *op. cit.*, 131.

foundations upon which Western and Soviet combat units are configured. The Western configuration (equipment and personnel) primarily assumes a conventional battlefield upon which nuclear weapons may be necessary. The Soviets assume a nuclear battlefield where conventional operations will also be a necessity. The West seeks an 'either/or proposition' concerning nuclear weapons in theater doctrine, whereas the Soviets have imposed integration.²²⁰

Thus, from an "organize, train, and equip" perspective, the Soviet military certainly faced coordination challenges but was unmatched in nuclear-conventional synchronization. This was conceded by Secretary of Defense James Schlesinger in 1975.²²¹ It was still the case a decade later, when the U.S. Army acknowledged in 1986 that the Soviets were, "better equipped, structured, and trained to conduct NBC warfare than any other armed force."²²²

Additionally, Soviet conventional preemption of NATO's nuclear forces was highly innovative for its time. It would be some years before the U.S. Navy developed its *Maritime Strategy*. Soviet military planners recognized that surprise, particularly in the initial period of war, was perhaps the single most important condition for success in conflict and planning proceeded on the basis that nuclear operations could begin at any time.²²³ This led some American analysts to suggest that little difference existed between conventional and nuclear operations in the Soviet military.²²⁴ As described above, the Soviets appreciated the unique differences between conventional and nuclear operations (e.g., impacts on rate of advance,

²²⁰ Mercer, *op. cit.*, 29.

²²¹ "[Soviet] force posture, equipment, doctrine, and training indicate more emphasis than NATO on combined conventional-nuclear operations; with conventional forces being better prepared than NATO forces to operate in a nuclear and chemical warfare environment." See, Secretary of Defense James R. Schlesinger, *The Theater Nuclear Force Posture in Europe: A Report to the United States Congress in compliance with Public Law 93-365*, April 1, 1975, 14. Declassified

²²² Department of the Army, Field Manual FM 100-31-1, *Nuclear Weapons Employment Doctrine and Procedures*, January 1986.

²²³ Douglass, 1976, *op. cit.*, 31.

²²⁴ Charles J. Dick, "Soviet Operational Concepts: Part II," *Military Review* 65, no. 10 (October 1985): 11.

dispersal guidelines, targeting, etc.). Strategically, however, it is true that all Soviet plans commenced from the basic, overarching objective of degrading and destroying Western nuclear forces, infrastructure, and command and control prior to nuclear release. Importantly, this was not viewed in Soviet military circles as strengthening the nuclear-level of conflict at the expense of winning the “conventional” warfight. Rather, such operations were viewed synergistically. Massive conventional strikes to degrade NATO’s nuclear capability and capacity would reduce the nuclear threats to advancing Warsaw Pact forces, thereby increasing the probability of the front’s success. Arguably, the twin expectations of inflicting heavy damage on NATO theater nuclear forces yet some unavoidable amount of NATO nuclear use tended to reduce Soviet concerns about the escalatory impact of their own actions.

The Soviet approach to reconstitution of losses from nuclear strikes on a unit was also a major advantage over NATO. As described above, the Soviet Union largely favored replacing entire units rather than individual soldiers.²²⁵ Unit reconstitution allowed for sustained pressure and rapid mobility for advancing ground forces. This reconstitution edge was enabled by the sheer number of divisions the Warsaw Pact maintained compared to NATO and comported with Soviet emphasis on the achievement of strategic objectives on strict timelines.

Finally, the Soviet approach to synchronization emphasized the psychological and morale aspects of nuclear war in troop training. This imperative stretched all the way back to the 1954 Totskoye nuclear test. As noted by Colonel P. Tsygankov, “The development, in complex conditions of nuclear war, of a strong impetus to advance and overcome the psychological barrier caused by the enemy’s use of weapons of mass destruction is the most important task of political officers and communist party.”²²⁶ Far from being unthinkable, Soviet military leaders understood

²²⁵ The Soviet Union may also have considered other approaches to reconstitution, particularly as they came to rely more heavily on conventional operations and plans. For example, a severely attrited formation (e.g., battalion) may form the basis for a smaller composite unit (e.g., company). See Graham H. Tuberville, Jr., “Sustaining Theater Strategic Operations,” *Journal for Soviet Military Affairs* 1, no. 1 (April 1988): 39-52.

²²⁶ Odom, *op. cit.*, 118.

that nuclear warfare required special attention to “psychological toughness.”²²⁷ As explained by General V. F. Tolubko, the success of military action depends on the “mental qualities of the soldiers, on the course of the mental processes, and the respective state of mind of the combatant, which is formed through theoretical ‘soul hardening’ and familiarizing Soviet soldiers with the probable conditions of combat by injecting realism into rigorous training for war.”²²⁸ Sustained and realistic training was employed to reinforce the notion that nuclear war may still be fought and could still be won. While acknowledging the sheer power of nuclear weapons, the emphasis of troop training was on survivability.²²⁹ Training – coupled with propaganda – sought to bolster troop confidence in the protective value of equipment and maneuver to ensure they were not overwhelmed by fear based on ignorance.²³⁰ This was framed as a key advantage vis-à-vis NATO. As noted by an American expert, “Exploiting the psychological shock appears to be given much more prominence in Soviet doctrine than in U.S. doctrine, particularly in the case of nuclear weapons, where they recognize that the shock or psychological effect may extend far beyond the immediate lethal area of blast or radiation.”²³¹

Remaining Gaps in Nuclear-Conventional Synchronization

Despite the coherence achieved among Soviet doctrine, strategy, and capabilities, certain synchronization shortfalls endured throughout the Cold War. For example, Soviet military literature revealed very little concern for “destabilizing” actions that might escalate a conflict in unexpected ways.²³² Soviet doctrinal importance on anticipating and preempting a NATO nuclear attack would likely have generated significant pressures for massive nuclear employment by NATO were concentrated

²²⁷ Ibid.

²²⁸ Pruck, *op. cit.*, 75-78.

²²⁹ Odom, *op. cit.*, 120.

²³⁰ Donnelly, *op. cit.*

²³¹ Douglass, 1976, *op. cit.*, 50.

²³² Welander, *op. cit.*

Warsaw Pact conventional attacks to occur. Likewise, Soviet planners overlooked entirely the escalatory impact their own heavy emphasis on targeting dual-capable forces and infrastructure with non-nuclear means may have had on NATO decision-makers. At the same time, writings and exercises suggested that Warsaw Pact planners did not expect their nuclear forces to suffer significant losses during conventional combat²³³ This is surprising in that U.S. and NATO doctrine became increasingly focused on targeting Warsaw Pact nuclear-capable units in the 1980s.

Irrespective, the Soviet imperative to pre-empt NATO nuclear use with a massive nuclear barrage of its own carried extremely high risks of rapid and uncontrollable escalation. This is particularly so in the event NATO simply dispersed its nuclear weapons to increase pre-launch survivability, which evidently was a critical indicator of an impending nuclear attack in Soviet nuclear planning. This risk of escalation would have been exacerbated by inadequate or incomplete Soviet reconnaissance-strike operations during a conflict. This acknowledged gap, which was key to pre-emptive damage limitation, plagued Soviet planners in terms of detecting, tracking, and destroying NATO's mobile land formations and nuclear strike systems, as well as SSBNs within the European theater in both non-nuclear and nuclear attack scenarios. While this risk was offset somewhat by exercises where it appears the Soviets entertained the notion of not responding to very limited forms of NATO nuclear employment with nuclear use of their own, this was only considered by a small group of the General Staff and remained a subordinate option to massive theater retaliation. Thus, as noted by a declassified CIA assessment, "During the fog of war, it is easy to see how misperception or confusion could produce pressure on Soviet commanders to use nuclear weapons."²³⁴

Soviet planners also demonstrated a tendency to underestimate friction in synchronizing nuclear and non-nuclear operations. For example, exquisite timing between strategic nuclear strikes in theater and nuclear strikes at the operational-tactical levels was demonstrated in the highly scripted and controlled atmosphere of exercises. This included heroic

²³³ "Warsaw Pact Tactical Forces: Capabilities and Readiness for Nuclear War," *op. cit.*, 18.

²³⁴ *Ibid.*

assumptions about how fast Soviet ground forces could clear nuclear debris, reconstitute materiel losses, and advance, particularly in light of how many nuclear weapons both sides were expected to use. Warsaw Pact planners became more realistic later on about the potential for widespread nuclear use to gridlock movement on the battlefield though relatively high rates of advance were still envisioned. This potential for gridlock was probably worsened, in part, by the Soviet attachment to high-yield tactical and operational-tactical nuclear weapons to achieve damage criteria (something which changed after the Cold War, with an emphasis on significantl smaller-yield weapons). While lower yields and less munitions were slowly incorporated, the sheer volume expected remained an impediment to the precise force movement timelines anticipated.

The Soviet Union was not immune from other coordination challenges that would have manifested on the nuclear-conventional battlefield. Like NATO, withholding large numbers of missile, rockets, and aircraft for possible nuclear missions significantl decreased the amount of conventional firepower that could be brought to bear. Though the Soviet Union developed some solutions to reduce the withhold burden on the air component, limited ability to swap conventional and nuclear warheads at sea locked the Soviet Navy into apportioning a high percentage of its missiles and torpedoes to the nuclear mission. Such tradeoffs were never fully resolved. Additionally, exercises and Soviet writings revealed duplicative targeting by adjacent units that led to wasteful expenditure of nuclear weapons. In the late stages of the Cold War, the growing Soviet reliance on conventional munitions for the initial non-nuclear phase of combat likely would have left critical rear-area targets, including NATO nuclear forces, under-serviced particularly when compared to the damage inflicted with nuclear warheads against imprecise targets.

Finally, and particularly in light of the poor performance of Russian forces in Ukraine, it must be acknowledged that we may have overestimated the Soviet military's ability to operate under the actual stress of an irradiated battlefield. To be sure, there were skeptics of Soviet CBRN proficiency on both sides. According to an American expert, "when on exercise the average Soviet soldier spends less time in his protective suit and gas mask than does his British counterpart. Respirators are not normally



Figure 24: Soviet troops manually decontaminate vehicles at Chernobyl in 1986. Photo Credit: IAEA Image Bank

worn for much more than two hours at a stretch.”²³⁵ In 1977, then-Marshel Kulikov noted that training revealed enduring Soviet weaknesses in reconstitution after enemy use of nuclear weapons. He further noted that Pact forces were underestimating the casualty-producing effects of nuclear weapons and their aftereffects, especially their morale-psychological influence on troops.²³⁶ The lower quality

and priority of medical treatment in the Soviet military suggested that mortality and morbidity from CBRN exposure would likely exacerbate high personnel losses.²³⁷

The response to the Chernobyl nuclear power plant disaster in 1986 provides a useful metric to evaluate Soviet competence in this respect. The Soviet Chemical Troops, charged with providing defense against nuclear, chemical, and biological weapons, performed a variety of tasks associated with the clean-up operation. A study conducted by William Potter and Lucy Kerner on their performance at Chernobyl exposes often ill-prepared troops operating with old and ineffectual equipment. For example, the dosimetric equipment used by the Chemical Troops was produced in the 1960s and did not have the ability to detect powerful doses of gamma emission or beta rays harmful to humans.²³⁸ The standard decontamination compound used by the troops did not work well. The film produced by this spray quickly clogged the lines of the decontamination machines and much of the work had to be done manually.²³⁹ Although the exterior of the armored vehicles was cleaned when they returned from the reactor site,

²³⁵ Donnelly, *op. cit.*

²³⁶ “Soviet Concepts for Employment of Nuclear Weapons in a Conflict with NATO – Evidence from Warsaw Pact Military Exercises,” *op. cit.*, 13.

²³⁷ Baxter, *op. cit.*

²³⁸ William Potter and Lucy Kerner, “The Soviet Military’s Performance at Chernobyl,” *Soviet Studies* 43, no. 6 (1991).

²³⁹ *Ibid.*, 1031-1032

often nothing was done to decontaminate the interior of the vehicle.²⁴⁰ First-hand accounts explained that frequently personnel were simply denied adequate training and equipment.²⁴¹

According to Potter and Kerner, poor or insufficient training was to blame for much of the Soviet military's shortcomings at Chernobyl. As a result, a number of errors were made in the preparation of maps and safety procedures within the contaminated zone.²⁴² For example, a large number of reservists were mobilized to respond to the radiological event, many of whom had not been retrained in decontamination techniques.²⁴³ A number of decisions made by Soviet military leaders, particularly Colonel-General Pikalov who commanded the Chemical Defense Troops in Chernobyl, also raise questions as to their appreciation of the dangers posed by putting personnel in the contaminated zone without adequate protection.²⁴⁴ The implications for troop performance in an actual nuclear war environment were telling: "the reaction of soldiers to real radioactive contamination is reflected in a certain psychological excitement. The invisible danger initially produces 'tension and alarm,' but over time the soldiers become accustomed 'to the ever-present danger' and may fail to observe safety precautions."²⁴⁵ The Chernobyl experience suggests a Soviet military that was more susceptible to the hazards of a nuclear battlefield than was typically assumed, both in NATO and the Soviet High Command.

²⁴⁰ Ibid., 1032.

²⁴¹ Ibid., 1033.

²⁴² Ibid., 1032.

²⁴³ Ibid., 1033.

²⁴⁴ Ibid.

²⁴⁵ Ibid., 1032.

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**CHAPTER FIVE: U.S. and Soviet Approaches to Nuclear-
Conventional Synchronization Compared**

Having reviewed the U.S. and Soviet approaches to nuclear-conventional synchronization during the Cold War, it is useful to compare the two, as they potentially offer key insights into institutional predilections and dynamics that impact today’s warfighte . Of particular relevance is how the two sides came to view limited use of nuclear weapons.

To assist in that comparison a basic distinction is drawn – what was similar in the approaches and what was dissimilar. For analytical purposes, we can consider three blocks of time: the late 1940s-1950s, when initial hesitancy about nuclear weapons gave way to a force mix that favored them over conventional weapons; the 1960s, when greater emphasis began to be placed on conventional forces; and the 1970s-early 1990s, when new conventional and limited nuclear concepts played out until the abrupt ending of the Cold War (see Figure 25). The main nuclear-conventional synchronization traits for a given timeframe are summarized in a corresponding table; they are generally listed in chronological order, although there is some overlap (see Tables 6-8). A trait is considered “similar” if it occurs in the United States and the Soviet Union within the same time block. Those that take more than one time block to achieve commonality or are otherwise instructive (e.g., demonstrate close action-reaction coupling within a given timeframe) are initially listed

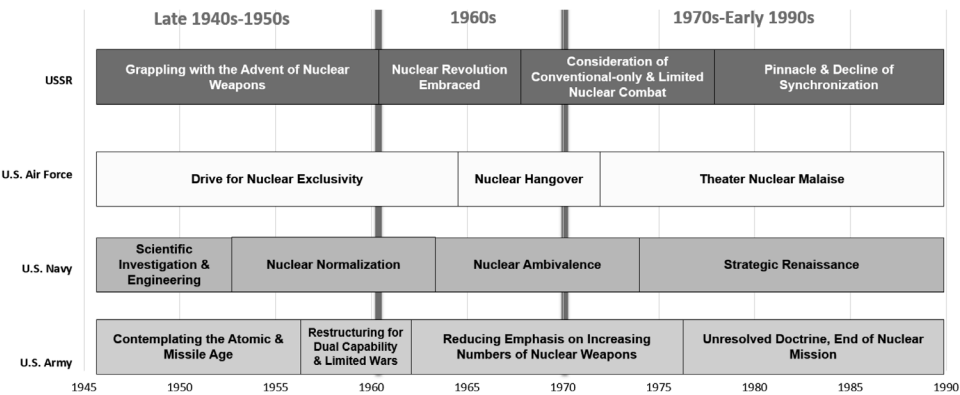


Figure 25: U.S. and Soviet Nuclear-Synchronization Phases Over Time.

as “dissimilar” with a corresponding entry on the “similar” side of the ledger generally reflecting that one side’s thinking has “caught up” with the other. Of course, commonality does not necessarily signify emulation; each side could reach similar conclusions for different reasons, as noted. Lastly, some of the dissimilarities remain so throughout the Cold War. For example, as an alliance of democracies, NATO had to contend with public opposition to nuclear weapons, something the Warsaw Pact never faced.

Overall, much similarity in approaches to nuclear-conventional synchronization is evident between the United States and the Soviet Union, indicating a certain logic of military science, universal bureaucratic behavior, and common civilian or party control over the armed forces. The dissimilarities stem from the obvious differences in political systems, levels of technology, and military objectives.

The Late 1940s-1950s

Contrary to expectations that warriors by nature would enthusiastically embrace nuclear weapons, the U.S. and Soviet armed forces initially proved the opposite. Conservative in outlook, the militaries on both sides were deeply committed to conventional doctrines and weapons systems that each believed had just won the Second World War. They were skeptical about the atomic bomb because the technical details of this novel technology were highly secret and compartmentalized, the weapons were in short supply, and there were political constraints on planning for their use. Maintaining, if not expanding, conventional forces served their parochial interests with regard to budget, manpower, and import. Indeed, the Soviet Union did not even produce detailed nuclear employment plans until after Stalin’s death in 1953. The militaries’ main frame of reference was that atomic weapons were simply bigger, and therefore more “efficient,” bombs to be incorporated into conventional military planning, particularly strategic bombing missions. For example, now a single plane carrying a single bomb could raze a city compared to the hundreds of bombers that would be required with standard high explosives. Before long, each side put its stock in long-range delivery systems and strategies to deliver at the outset of war a massive nuclear blow against the other’s homeland.

As fissile material production expanded and lighter nuclear weapons became feasible, each side's armed forces saw in atomic munitions a more effective means to breach enemy lines and allow for deep penetration by tanks and infantry. At the same time, they struggled with how to disperse ground forces to reduce their vulnerability to nuclear attack without increasing their vulnerability to conventional attack. They also recognized that economically and practically it was not feasible to maintain two different kinds of armies, one for nuclear warfare and one for non-nuclear. Conventional air, sea, and land forces had to be equipped for both kinds of combat at all times, since both sides assumed that any major East-West conflict would be nuclear from the outset. Because missile accuracies were poor at this time, both sides relied on high-yield nuclear weapons. In the theater context, each side was planning to use many hundreds of these weapons on the other; resulting troop and civilian fatalities would have dwarfed even the scale of World War II and would have left Europe a radioactive wasteland for generations.

The U.S.-Soviet similarity in approach to nuclear-conventional integration in this timeframe owes much to a common problem — namely, how to integrate new and poorly understood technology into conservative institutions. The U.S. Army, in particular, was grappling with the implications of the atomic battlefield openly in professional journals throughout the period. Declassified Soviet materials show similar lines of thinking. It is quite conceivable that the Soviets were closely following the U.S. Army debate. At the same time, war has a logic of its own that transcends national boundaries, and the two armies were quite capable of reaching similar conclusions independently of the other. Political leaders on both sides also were struggling to contain the costs of the Cold War and saw nuclear weapons as more cost-effective than conventional forces (see Table 6).

Late 1940s-1950s	
Similar	Dissimilar
Initial military reluctance to adopt atomic weapons • Uncertainties about technical details and supply • Wedded to combat-tested conventional organization and doctrine	U.S. lacks a general staff, giving the armed services autonomy to devise their own approaches to the integration of nuclear and conventional weapons • Feeds intense inter-service competition for nuclear missions, resources
Military largely asserts that atomic weapons are simply more powerful munitions that did not alter classic principles of warfare • Indeed, to compensate for expected higher losses from atomic attacks, even larger conventional forces will be needed	U.S. categorizes nuclear weapons as either “strategic” or “tactical.” The Soviets characterize nuclear weapons along geographic targeting lines as “tactical,” “operational-tactical,” or “strategic”
Hasty testing of atomic weapons with troops to demonstrate compatibility with traditional tactics • “Hugging” enemy troops at the front line seen as way to reduce exposure to atomic attack	USSR creates the Strategic Rocket Forces as a new and pre-eminent branch of the armed forces
Political leaders embrace nuclear weapons as more cost-effective than conventional forces	Dreading Soviet surprise attack, NATO puts a portion of its theater nuclear forces on quick-reaction alert
Even while strategic forces receive top priority, nuclear weapons proliferate across general purpose forces, as fissile material becomes more widely available	Fears of massive loss of life and destruction, particularly in West Germany, undermine West European public support for nuclear weapons in the defense of NATO
Initial missile and rocket delivery systems lack accuracy and carry high-yield nuclear warheads to compensate • Targets thus were mainly large and fixed (e.g., cities, airfields, ports, troop concentrations)	U.S. Army re-organizes its basic force structure and adopts the “Pentomic” division in bid to meet the needs of the atomic battlefield. Soviet forces remain as they were, though new rocket and missile force troops are added at the front, army, and division levels

Table 6a: U.S. and Soviet Nuclear-Conventional Synchronization, Late 1940s-1950s.

Late 1940s-1950s (continued)	
Similar	Dissimilar
In ground forces doctrine, nuclear weapons would punch holes through enemy lines, enabling swift penetration by conventional forces into vital rear areas, and complete the destruction of remaining enemy forces	U.S. Navy aircraft carriers become major nuclear weapon delivery platforms • U.S. battleships are equipped with nuclear rounds for their 16-inch guns
Struggle to balance dispersal of ground forces to reduce their vulnerability to nuclear without increasing their vulnerability to non-nuclear attack	U.S. has numerical superiority in nuclear weapons, mainly delivered by long-range bombers • U.S. Air Force dominated by World War II strategic bomber mentality and leadership
Emerging presumption that war would quickly lead to nuclear strikes against each other's homeland • Imperative to launch the full nuclear arsenal in the shortest amount of time	U.S. Army and Navy skeptical that theater nuclear use makes a strategic nuclear exchange inevitable • Pay little attention to escalation risk
Theater nuclear plans and exercises entail the use of many hundreds of nuclear weapons in Central Europe, which would quickly cause massive destruction and millions of civilian and military casualties	Presiding over an alliance of democratic nations, the U.S. challenged to reassure NATO members • West European states want nuclear protection as sign of U.S. commitment but are opposed to its warfighting aspects
Recognition that nuclear and non-nuclear conflict could not be separated from each other; an East-West conflict would be nuclear from the outset	
Military education and training shifts to emphasize nuclear over conventional combat. Realism often lacking, however	
While retaining custody and control over their associated nuclear warheads, tactical and theater-range delivery systems are provided to allies	

Table 6b: U.S. and Soviet Nuclear-Conventional Synchronization, Late 1940s-1950s.

As for dissimilarities, without a General Staff or much of a joint approach, the U.S. armed services were locked in a fierce competition with each other for nuclear missions and resources that gave rise to nuclear-armed aircraft carriers and battleships, as well as re-organized “Pentomic” Army divisions. Seeking to differentiate themselves from the Air Force, the Army and Navy repudiated massive nuclear retaliation as militarily ineffective and morally reprehensible. Their (relatively) more discriminate approach to nuclear use was preferable, they argued, and need not result in a strategic nuclear exchange. This thinking tended to neglect, however, the potential for even limited use of nuclear weapons to escalate to that level. In contrast, following the death of Stalin, Soviet party leaders seized on the transformational nature of nuclear weapons and missiles and imposed on the Soviet military a doctrine emphasizing the early, global, and massive use of nuclear weapons and a new and pre-eminent branch of the armed forces, the Strategic Rocket Forces.

The 1960s

This was a highly dynamic period for nuclear-conventional integration. The Kennedy Administration quickly cast aside massive retaliation for what it believed would be a more flexible and credible response that stood a better chance of deterring war or failing that, managing escalation from the conventional to the nuclear level. This was followed by U.S. re-investment in conventional forces. The Soviet Union took note of this shift, and late in the decade its military strategists acknowledged for the first time that war could begin with a non-nuclear phase (though as noted in Chapter Four, the Soviet military largely believed such a phase would transition to eventual nuclear employment). Soviet conventional force spending also went up. Nonetheless, each side was still grappling with how much nuclear ordnance to assign to general purpose forces – hundreds of fighter-bombers were being withheld from the conventional fight for theater nuclear missions and naval vessels had to trade off nuclear for conventional rounds before they left port.

These similarities reflect nuclear learning of sorts. While the United States was moving to de-emphasize nuclear weapons even before the Kennedy Administration, doubtless the Cuban Missile Crisis opened both sides' eyes to the risks and stakes of nuclear war. This helped stimulate each side to look more closely at non-nuclear combat, despite mutual misgivings about the likelihood of a potential conflict remaining so. It also encouraged the Soviet Union to seek parity, and eventual perceived superiority, in strategic nuclear systems. In addition to this interactive learning, the universal principle of military prudence helps account for why both sides were withholding large numbers of theater aircraft for possible nuclear missions.

The main U.S.-Soviet dissimilarity in this period stems from differing attitudes toward escalation. While the United States was seeking to manage escalation via a more flexible response, the Soviet Union was honing a different approach – limiting the damage from an imminent NATO nuclear strike by preparing for massive nuclear preemption. In short, Soviet military thinking favored blunt force damage limitation over nuanced signaling and bargaining. The Soviet Union worked its conventional forces into this damage-limiting construct by targeting them against as much of the West's nuclear firepower and supporting infrastructure (i.e., NC3, aircraft carriers, etc.) as possible during the non-nuclear phase of combat. By contrast, the U.S. Navy was stuck in a World War II mindset, still largely postured to defend transatlantic convoys that would reinforce NATO in the event of war with the Soviet Union (see Table 7).

1960s	
Similar	Dissimilar
After U.S. shifts to strategy of Flexible Response to rely more on conventional forces and forestall nuclear escalation, USSR acknowledges war could begin with a non-nuclear phase	Damage limitation is USSR's preferred approach to escalation management; postures for massive nuclear pre-emption should a NATO nuclear strike seem imminent
Political leaders' hopes that nuclear weapons could supplant conventional forces fade; spending on both increases	USSR pioneers concept of using conventional forces to attrite enemy strategic nuclear forces (e.g., SSBNs, aircraft carriers), though the actual ability to do so effectively – particularly against SSBNs – was probably limited at best
Availability of aircraft and missiles for the non-nuclear phase of combat constrained by the need to withhold a sizeable portion for nuclear missions in the event of escalation	USSR continues to train rigorously and exercise for the nuclear battlefield
Naval general purpose vessels have to decide nuclear and conventional weapons load-out prior to leaving port	USSR fields armored vehicles designed to protect troops against CBRN weapons
At decade's end, USSR approaches strategic nuclear parity with the U.S. and also fields a "triad" of ICBMs, SLBMs, and long-range bombers	U.S. Army abandons the Pentomic division for greater conventional staying power
	U.S. Air Force employs (in Vietnam) strategic bombers in a non-nuclear role
	NATO makes a major investment in nuclear-capable artillery

Table 7: U.S. and Soviet Nuclear-Conventional Synchronization, 1960s.

Unlike NATO, the Soviet military concept for nuclear conflict remained cohesive; Warsaw Pact forces continued to train rigorously for the nuclear battlefield and its armored vehicles were fielded with CBRN protection systems. Improved missile and rocket systems were developed and deployed. Realistic nuclear training remained a core component in unit and individual training and education. In contrast, the U.S. Army lost institutional focus; the Pentomic division was rapidly abandoned for one with more conventional firepower, even as the service was placing more emphasis on nuclear-capable artillery. Slow to embrace flexible response, the U.S. Air Force made a difficult and costly transition from a nearly exclusive nuclear focus to the use of its strategic bombers for conventional strikes in the Vietnam War.

The 1970s-Early 1990s

During the 1970s and 1980s, U.S. and Soviet approaches to the synchronization of nuclear and conventional planning increasingly aligned in numerous respects, as one side “caught up” to the other (see Table 9). For instance, seeking to demonstrate its value in deterring conflict in Europe or discouraging its escalation, the U.S. Navy realigned its strategy, *inter alia*, explicitly to target Soviet SSBNs for destruction by conventional means. Navy leaders justified the new approach publicly by noting that targeting of U.S. SSBNs had long been Soviet naval strategy. The U.S. Army, for its part, began to add CBRN protection to its new main battle tank and infantry fighting vehicle, emulating long-standing Soviet practice. NATO caught up to Soviet Union by deploying new mobile IRBMs.

1970s-Early 1990s	
Similar	Dissimilar
U.S. Navy catches up to USSR in planning to attack SSBNs using conventional naval forces • Later codified in <i>The Maritime Strategy</i>	For the U.S., the purpose of theater nuclear use is no longer to defeat the enemy or limit its ability to inflict nuclear damage but to force a negotiated settlement on acceptable terms without further escalation
USSR catches up to the U.S. in recognizing that large-scale nuclear use would be catastrophic and counter-productive to friendly combat operations in Europe • Both sides explore limited theater nuclear use	U.S. Army considers employment of up to 100 nuclear weapons in a single “limited” pulse, whereas even one-tenth of that would have exceeded the Soviet definition of “limited” and likely triggered massive nuclear retaliation
Warsaw Pact catches up to NATO in adoption of nuclear-capable artillery	USSR to reconstitute ground forces lost to nuclear attack at the unit level, whereas U.S. remains wedded to replacing individual soldiers
U.S. catches up to the USSR in equipping armored vehicles with CBRN protective systems	USSR continues to train rigorously and exercise for the nuclear battlefield
Shift in focus to precision conventional strike and the deep battle alongside modernization of theater nuclear forces • Improvements in missile accuracy enable precision conventional warheads and shift to lower-yield nuclear warheads	U.S. develops enhanced radiation nuclear weapons but does not deploy them to Western Europe because of public opposition there • USSR successfully manipulates anti-nuclear sentiment to preclude deployment
Efforts to free-up aircraft for conventional missions by shifting their nuclear burden to other delivery systems	USSR deploys SS-20 mobile IRBMs, each with 3 MIRVs, capable of targeting all of European NATO • West Germany presses U.S. for an off-setting deployment to show commitment

Table 8a: U.S. and Soviet Nuclear-Conventional Synchronization, 1970s-Early 1990s.

1970s-Early 1990s (continued)

Similar	Dissimilar
NATO catches up to USSR with deployment of new mobile IRBMs; also deploys new GLCMs	In late 1970s-early 1980s, NATO agrees to unilaterally withdraw 2,400 nuclear warheads from Europe
Under the 1987 INF Treaty, all U.S. and Soviet ground-launched ballistic and cruise missiles with a range of 500-5,500 km destroyed under U.S. and Soviet supervision by June 1991	USSR pledges in 1982 not to be the first to use nuclear weapons in a conflict.
Presumption that Soviet nuclear use would not commence at sea until it had occurred on land	The Warsaw Pact dissolves, July 1991
	Under the September 1991 Presidential Nuclear Initiative (PNI), the U.S., inter alia, unilaterally removes all but a small number of its nuclear weapons from W. Europe • U.S. Army is fully de-nuclearized • U.S. Navy general purpose forces are de-nuclearized • Subsequent to NATO decision, USAF tactical nuclear gravity bombs in W. Europe cut in half The U.S. encourages the USSR to reciprocate
Responding to the U.S. PNI, Gorbachev announces in October 1991 that the USSR, inter alia, will unilaterally: • Eliminate all nuclear artillery, short-range missile warheads, and nuclear land mines • Remove from deployment all nuclear weapons for surface ships, attack submarines, and land-based naval aircraft; some of which would be eliminated, the rest put in storage	
	The USSR dissolves, Dec. 1991

Table 8b: U.S. and Soviet Nuclear-Conventional Synchronization, 1970s-Early 1990s.

In turn, the Soviet Union came to the same realization as the United States that nuclear use in Europe on the scale contemplated in the 1950s and 1960s would have been catastrophic and counterproductive to friendly combat operations. Both started to look closer at much more limited nuclear use and entirely non-nuclear scenarios. Soviet ground forces also made a big investment in nuclear-capable artillery and lower-yield nuclear rounds at this time, filling a gap that spanned decades compared to NATO.

There is convergence in other aspects of U.S. and Soviet nuclear-conventional integration. Principally, this was the recognition that a new era of technological transformation was dawning – precision conventional strike. Both sides deployed more accurate delivery systems that could reduce reliance on high-yield nuclear warheads or nuclear warheads *per se*. They also looked for ways to shift and reduce the theater nuclear burden generally to free up more aircraft for conventional combat. After deploying a new generation of long-range theater nuclear missiles, both sides agreed to scrap them under the 1987 INF Treaty.

Another aspect of concurrence involves Soviet nuclear use at sea. As the U.S. Navy grappled with the massive expansion and nuclearization of the Soviet Navy in the 1970s, it reasoned that nuclear use at sea by the USSR would not precede its use in the European land battle, which was far more important to Soviet party and military leaders. While this proposition may have been supported by U.S. intelligence at the time, interviews with former-Soviet military leaders and declassified Warsaw Pact writings appear to confirm that this was indeed the case. In short, it was highly unlikely that U.S. naval forces would have faced a “bolt from the blue” nuclear attack, a scenario that was hotly debated at the time. However, once nuclear use had occurred on land, the Soviet Navy was intent on almost unlimited nuclear use at sea, something the U.S. Navy was not prepared for and which it conceded would put the outcome of the naval battle in doubt.

Remaining differences in nuclear-conventional synchronization between the U.S. and Soviet Union during this timeframe relate mainly to the perceived purposes of theater nuclear use, with the United States shifting from defeat of the enemy to forcing a negotiated settlement on acceptable

terms. In this broader shift from a theater nuclear warfighting posture, NATO agreed to withdraw unilaterally 2,400 nuclear warheads from Europe. The Soviet Union was not similarly inclined. While it proffered a nuclear no-first use pledge in 1982, it did so as a transparent and unsuccessful ploy to forestall NATO deployment of new IRBMs. Unlike NATO, the USSR continued to train its forces rigorously for theater nuclear combat, even as it began to introduce non-nuclear exercises. Indeed, massive nuclear preemption or launch-on-warning strikes to limit damage and defeat NATO forces remained the principal planning scenario for Pact forces.

A critical divergence, upon which escalation to full-scale nuclear conflict in Europe and beyond might well have hinged, was the wide gap in what constituted “limited” nuclear use for each side. As noted in Chapter One, when the U.S. Army moved from unlimited to constrained nuclear use doctrine in the 1970s, it adopted the planning construct of a nuclear “package” comprising 100 to 200 nuclear weapons that could be fired by a corps, once presidential authority had been granted. To signal to the Soviets that it was a “limited” gesture, the package would be fired in a single 45-minute pulse. While the Soviet General Staff had been entertaining the possibility of limited nuclear response options in the early 1970s, they were predicated on a very limited nuclear first use by NATO – potentially as few as 10 nuclear weapons – as well as an expectation of Warsaw Pact success on the battlefield (see below). NATO employment of more than a dozen or so nuclear weapons likely would have invoked the massive nuclear strike for which Soviet theater forces had been training assiduously. This order of magnitude disparity in what constituted “limited” nuclear use was not simply academic, it held within it the seeds of rapid and uncontrollable nuclear escalation.

At the same time, Soviet interest in damage limitation/counter-nuclear targeting during a conventional phase of combat was equally problematic. As the Soviets operationalized Ogarkov’s concepts of deep battle, efforts to disrupt and defeat NATO nuclear forces before they could be employed remained a constant theme. Targets included not just the weapons themselves, but also the command, control, and communications infrastructure underpinning NATO nuclear employment options. The Soviets apparently gave little forethought to the destabilizing pressures

such a disarming effort may generate on NATO leaders already scrambling to halt a rapid Warsaw Pact onslaught.

Of course, major divergences emerged late in the Cold War, with the fall of the Berlin Wall in 1989 and the dissolution of the Warsaw Pact two years later. Seizing on the moment, the United States essentially dismantled unilaterally its theater nuclear capability, stripping the U.S. Army of its nuclear mission, removing nuclear weapons from general purpose naval forces, and leaving a drastically reduced stock of Air Force gravity bombs in Europe. At this point, the Soviet leadership accepted the U.S. invitation to reciprocate. The USSR vowed to eliminate all nuclear artillery, short-range missile warheads, and nuclear land mines. It also pledged to remove all nuclear weapons from its surface ships, attack submarines, and land-based naval aircraft; some to be eliminated, the rest to be put in storage. Within two months, the Soviet Union itself would be disbanded, ending the Cold War but not without some uncertainties, such as the extent to which Russia followed through on its promised unilateral cuts in theater nuclear forces.

Implications for Today's Warfighter

As the ongoing war in Ukraine makes clear, the Russian military threat to Europe did not end with the collapse of the Soviet Union and the cessation of the Cold War. Rather, it adapted and evolved. In retrospect, the Soviet military lagged behind U.S. concept development by years and never fully divested itself of tactical nuclear weapons, as the U.S. Army and Navy did. Soviet concepts of massive pre-emptive use of nuclear weapons against NATO in conjunction with a large-scale invasion only began to recede nearly a decade after the United States had jettisoned unlimited theater nuclear use. Moving into focus in the 1980s was a more nuanced Soviet approach to conflict with a nuclear-armed peer.

Contrary to widely held views among Western analysts and publics at the time, a very limited use of nuclear weapons by NATO would not necessarily have led to rapid and massive nuclear escalation by the Soviet

Union. As noted in Chapter Four, as early as 1973, a Soviet General Staff exercise postulated limited nuclear use by NATO – less than 10 weapons – *without invoking Soviet nuclear retaliation*, the caveat being that Soviet ground forces were still achieving their objectives and NATO was not posturing for more widespread nuclear use. Soviet General Staff officer noted such planning was largely drawn up amongst small circles with limited political oversight. Moving further into the 1970s and 1980s, Soviet military planning and exercises devoted more attention to limited and gradual nuclear use options. Nuclear weapons allocated to a front dropped by an order of magnitude, from an estimated 350 to 35 by 1983. After the Cold War ended, Russian military leadership acknowledged that the General Staff had previously developed limited nuclear response options, though such thinking was not fully embraced by all.¹ Thus, Russian interest in limited nuclear use did not emerge suddenly in the late-1990s as the military sought to recover from the collapse of the USSR; its foundation had been laid some two decades prior.

Against this backdrop, Moscow’s subsequent violation of the INF Treaty, retention of a major advantage over NATO in theater nuclear weapons, and doctrine to “de-escalate” a conflict through the limited use of nuclear weapons all underscore that nuclear weapons remain a critical part of the Russian theater force mix.² Indeed, the major losses of men and conventional weaponry in Ukraine are widely recognized as likely increasing Moscow’s reliance on theater nuclear weapons for the foreseeable future. Moreover, China has undertaken a massive effort to modernize and expand its entire nuclear force, to include theater weapon systems. While this study did not address China specifically, many of its lessons can and should be applied in the Indo-Pacific as well.

Comparing the Soviet and U.S. approaches to conventional-nuclear synchronization suggests a number of overarching implications for today’s warfighter

¹ See Chapter Four, 277-284.

² Michael Kofman, Anya Fink, and Jeffrey Edmonds, *Russian Strategy for Escalation Management: Evolution of Key Concepts*, Center for Naval Analyses, April 2020.

- The relationship between conventional and nuclear forces, and how it was operationalized in each nation's respective strategy, was a dynamic and core feature of Cold War competition. Each sought to gain advantage relative to the other in this regard not just through capability development but also doctrinal innovation. To reduce their own vulnerability and negate the other's advantages, they also emulated one another's posture to a certain extent. As the United States grapples with the emergence of strategic competition with both China and Russia, it is critical that U.S. policymakers and military official recognize the strategic value resident in synchronization. As such, ***conventional-nuclear synchronization is a near-constant, tailored effort to protect the Joint Force in ways that maximize advantage and minimize disadvantage relative to other competitors.***

- ***Innovative thinking is the key to synchronization success.*** During the Cold War, for example, use of non-nuclear means to hold nuclear assets at risk was first pioneered by the Soviet Union vis-à-vis Western aircraft carriers and SSBNs in the 1960s. The U.S. *Maritime Strategy* flipped this concept against the Soviet Union in the late-1970s and 1980s. The notion that conventional forces skillfully employed can help deter major power conflict and manage escalation remains valid. Indeed, there are more non-nuclear resources potentially available today in the form of space, cyberspace, and advanced analytics options. ***The West must devote more analytical effort to exploring the possibilities and attendant risks of non-nuclear counterforce (and balance thereof) in order to present decision makers with credible alternatives and remain at the forefront of concept development and strategy.***

- Soviet and Russian military planning accepts that very limited use of nuclear weapons is possible. In the Soviet era, this was in response to NATO's possible use of a handful of nuclear weapons. Today, it is keyed to helping Moscow escalate its way out of a failed conventional aggression. Further, Russian military planning probably expects, and is willing to accept, a similarly

limited U.S. nuclear response without automatically invoking further nuclear escalation. This strongly indicates that the United States and NATO must be prepared for limited Russian nuclear attacks in Europe and be able to meet their conventional military objectives in the aftermath. ***Inadequate conventional force resiliency and preparedness to conduct limited nuclear response options thus potentially undermine the credibility of NATO deterrence, including deterrence of more widespread use of theater nuclear weapons by Russia.***

- ***A closer look at Soviet-era limited nuclear response options may well shed some light on what Russian limited nuclear use could look like in practical terms*** – numbers, types, and yields of weapons; targets, etc. This could help U.S. and NATO military planners scope, better anticipate, and mitigate the Russian limited nuclear use threat. In a similar vein, institutionalized Soviet learning suggests that ***limited Russian nuclear use could also be directed at critical rear areas while Russian troops move to “hug” Western forces to make themselves less attractive targets for nuclear retaliation.*** Indeed, such maneuvering could provide indicators and warning of imminent Russian nuclear attack. However, it is important also to recognize that “limited” nuclear employment can vary widely across planning scenarios. This may be driven by a Russian requirement to achieve battlefield objectives first and psychological effects second – an approach more in-line with traditional Soviet approaches to conflict. Consequently, the Joint Force cannot simply assume that potential future Russian nuclear employment will be very limited (e.g., in yield, location, or number employed) and must prepare for a range of employment scenarios that includes larger-scale usage throughout Europe or in a specific area.
- It is important to note that history is not determinant but rather suggestive of what might happen if certain patterns of thinking and behavior endure. In this regard, Russia faces a different geopolitical context than during the Cold War. Rather than leveraging conventional-nuclear synchronization to seize all of

Western Europe, Moscow's goals are more limited today — that is, restoring its security buffer by piecemeal seizure of territory along its periphery. In contrast to the Cold War, theater nuclear forces today are intended to shield Russian troops and territory from Western conventional overmatch — particularly long-range precision strikes. Russia believes the United States is prepared to leverage rapid conventional precision strikes and missile defense to degrade its nuclear arsenal, command and control, and leadership in the event of a conflict. As such, the catalyst for Russian nuclear employment is qualitatively different, probably resulting in far more flexibility and sequencing in its application than Soviet-era nuclear employment plans. For instance, declassified materials and post-Cold War interviews make clear that the first Soviet use of a nuclear weapon was not going to take place at sea. Today, however, it is conceivable that the Russian General Staff could recommend initial nuclear employment against Western naval forces if it sensed they were aimed at decapitating the regime, disrupting its control and response options, and could not be thwarted by non-nuclear means alone. In short, ***Western planners cannot rule out that NATO naval vessels may be the initial target of Russian nuclear use under certain conditions — a clear change from Soviet doctrine. Western naval forces must ensure adequate resiliency to nuclear effects, similar to the ground and air components.***

- Finally, in a premeditated fashion, post-Cold War Russia violated the INF Treaty and re-constituted its theater-range nuclear missile capability, prompting the United States to withdraw from the treaty in 2019. History teaches that Moscow only agreed to give up its IRBMs under the treaty because the United States and NATO fielded a counter-balancing mix of land-based IRBMs and GLCMs. At present, there is no appetite in Russia for arms control of any sort. Nonetheless, ***it is not too soon for the West to contemplate how to resolve the INF issue.*** NATO's stance is a clear-cut refusal to countenance new land-based missile deployments by the Alliance, but that position was formulated before Russia's full-scale invasion of Ukraine in February 2022. Further developments in the Ukraine War may lead to

reconsideration of that stance. *The path forward may entail creative arms control approaches to INF-range missiles in (and beyond) the European theater. To offset the current imbalance, and give Moscow incentive to negotiate, NATO might consider new missile deployments, beginning with conventionally-armed hypersonic missiles. Measures to address the gap with Russia on theater nuclear weapons, which have never been treaty-limited, similarly need to be considered.*

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CHAPTER SIX: Cold War Nuclear-Conventional Synchronization Lessons Learned for Today's Warfighter

While the Cold War ended three decades ago, the underlying tensions between Russia and the West have not. Indeed, Moscow has brought war back to Europe to prevent Ukraine from joining the European Union and the North Atlantic Treaty Organization (NATO). In this unprovoked aggression, President Putin has intertwined nuclear threats with Russian conventional operations. In short, nuclear-conventional synchronization is reasserting its relevance. This gives rise to four key questions:

1. What does today's nuclear-conventional environment look like?
2. What aspects of Cold War nuclear-conventional synchronization are still relevant strategically and operationally?
3. What's different about nuclear-conventional synchronization today?
4. How should the United States and its Allies and partners carry forward nuclear-conventional synchronization to meet the needs of today's warfighter

1. Today's Nuclear-Conventional Environment

The overall security environment is more complex than the Cold War. In Europe, for example, cooperation with Russia under the 2002 NATO-Russia Council came to a halt in 2014, following Moscow's illegal seizure and annexation of Crimea. Russia and NATO have now declared each other a threat yet the arms control and confidence building measures of the Cold War have largely been dismantled. Sustained Russian cheating under the Intermediate-Range Nuclear Forces (INF) Treaty led the United States, with the backing of its NATO allies, to withdraw from the accord in 2019. In 2007, Moscow had suspended its compliance with the Conventional Forces in Europe (CFE) Treaty, which was designed to promote peace and stability in Europe by prohibiting the massing of conventional forces – to include that observed immediately preceding the Russian invasion of Ukraine in 2022. The only remaining constraint on Russian and U.S. strategic nuclear forces, the New START Treaty, will lapse in 2026.

In January 2023, the United States found Russia in non-compliance with its New START obligations;¹ in February, President Putin announced Russia was suspending its participation in New START. At stake is the long-held presumption in the West that Moscow sees strategic nuclear arms control as being in its interests. With treaty constraints on its military all but gone, Russia's threats to use nuclear weapons in its war with Ukraine are deeply troubling. Indeed, they were a major factor in persuading Finland and Sweden to join NATO.

The United States also now faces rising nuclear powers in the Indo-Pacific. China appears committed to overturning the rules-based international order – both regionally and globally – to one that better suits its interests. North Korea remains unpredictable and committed to threatening the United States and its allies. Neither China nor North Korea appear interested in agreeing to arms control and/or risk reduction measures. Against this fluid and volatile backdrop, strategic competition has only intensified – involving multiple domains simultaneously and featuring ever more sophisticated technologies – with unpredictable results. These domains and technologies – in combination and individually – are not separated from nuclear forces, but comingled in ways that could generate potentially unanticipated pressures during a crisis or conflict. As was recently observed, “Increasingly capable and intrusive digital information technologies, advanced dual-use military capabilities, and diffused global power structures will reshape future crises and conflict between nuclear-armed adversaries and challenge traditional ways of thinking about escalation and stability.”²

Yet nuclear weapons remain an integral feature of this increasingly complex security environment. Russia has perhaps as many as 2,000 non-strategic nuclear warheads (NSNW), an order of magnitude more than NATO is believed to possess.³ The poor performance of Russia's

¹ Michael R. Gordon, “U.S. Says Russia Has Violated Nuclear-Arms Treaty by Blocking Inspections,” *Wall Street Journal*, January 31, 2023, <https://www.wsj.com/articles/u-s-says-russia-has-violated-nuclear-arms-treaty-by-blocking-inspections-11675183584>.

² Rebecca Hersman, “Wormhole Escalation in the New Nuclear Age,” *Texas National Security Review* 3, no. 3 (Autumn 2020): 91.

³ 2022 *Nuclear Posture Review*, 4.

conventional forces in Ukraine suggests that Moscow's reliance on NSNW will likely increase over the next decade. The thrust of Russian contemporary nuclear doctrine is limited nuclear use in theater to lock in a land-grab or prevent conventional defeat, paradoxically described by the Russian military as "de-escalation." Over the next decade, China aims to modernize, diversify, and expand its nuclear forces. This includes a growing inventory of weapon systems designed to conduct both conventional and nuclear precision strikes against regional targets.⁴ Though China has long publicly claimed a "No First Use" nuclear policy, these capabilities will provide China's leaders with new options to leverage nuclear weapons for coercive and warfighting purposes.⁵ The intentional overlap of elements in China's nuclear and conventional command and control, basing, and force structure represent a unique integration challenge for the United States, as discerning nuclear signals from conventional ones may prove difficult during the fog of war.⁶ North Korea has also declared its intent to develop and field nuclear forces for battlefield and theater-level employment.

In contrast, with major strides in conventional precision strike, the United States and its allies have drastically reduced their reliance on nuclear weapons, completing the Cold War role reversal with Russia, in particular. As a result, a threat of massive first-use of nuclear weapons in theater has all but subsided. Instead, limited use of nuclear weapons by Russia, China, or North Korea to escalate their way out of failed conventional aggression seems the most plausible scenario. The United States and its European and Indo-Pacific allies must adapt to these changes in the security environment and be able to meet shared political-military objectives despite the threat or actual employment of nuclear weapons on a limited scale. Among other steps, this entails organizing, training, and equipping conventional forces to prevail on a nuclear battlefield. How to do so efficiently and effectively requires understanding the ways in which today's nuclear-conventional synchronization is similar to or different from its Cold War incarnation.

⁴ Department of Defense, "Military and Security Developments Involving the People's Republic of China 2021," Report to Congress, Office of the Secretary of Defense, 60-61

⁵ 2022 *Nuclear Posture Review*, 4.

⁶ See David C. Logan, "Are they Reading Schelling in Beijing? The Dimensions, Drivers, and Risks of Nuclear-Conventional Entanglement in China," *Journal of Strategic Studies* (November 12, 2020).

2. Which Aspects of Cold War-era Nuclear-Conventional Synchronization are Still Relevant?

Strategic

At the level of national and multi-national strategy, some of the key features of the Cold War continue to drive the need for, and concerns about, nuclear weapons in Europe. This section identifies those features from a “then” versus “now” perspective, noting some twists along the way.

Russia continues to seek advantage by exploiting perceived gaps in the spectrum of deterrence. The Soviet Union’s attainment of parity with the United States at the strategic nuclear level in the 1970s did not end Moscow’s ambitions. Rather, it encouraged Moscow to seek advantage on the theater level:

The Soviet [theater nuclear] buildup led to concern throughout the NATO alliance that a perceived gap had been created in NATO’s spectrum of nuclear deterrence. *The fear was that the Soviets might believe – however incorrectly – that they could conduct or threaten limited strikes against Western Europe from a sanctuary in the Soviet Union, on the assumption that, without strong theatre-based systems capable of reaching Soviet territory, and given the loss of U.S. strategic superiority, NATO lacked an appropriate means of response.* The December 1979 Alliance decision authorizing deployment of the Pershing II and GLCM...represented NATO’s efforts to redress this imbalance.⁷

The same Russian dynamic that drove the United States to deploy Pershing II and GLCMs in the 1980s is evident today, as noted in the 2018 Nuclear Posture Review (NPR):

⁷ Lieutenant Allan Gary Maiorano, USN, “The Evolution of the United States and NATO Tactical Nuclear Doctrine and Limited Nuclear War Options, 1949-1984,” Master’s Thesis, Naval Postgraduate School, December 1983, 135. Emphasis added.

Most concerning are Russia's national security policies, strategy, and doctrine that include an emphasis on the threat of limited nuclear escalation, and its continuing development and fielding of increasingly diverse and expanding nuclear capabilities. *Moscow threatens and exercises limited nuclear first use, suggesting a mistaken expectation that coercive nuclear threats or limited first use could paralyze the United States and NATO and thereby end a conflict on terms favorable to Russia.* Some in the United States refer to this as Russia's "escalate to de-escalate" doctrine. "De-escalation" in this sense follows from Moscow's mistaken assumption of Western capitulation on terms favorable to Moscow.

Effective U.S. deterrence of Russian nuclear attack and non-nuclear strategic attack now requires ensuring that the Russian leadership does not miscalculate regarding the consequences of limited nuclear first use, either regionally or against the United States itself. Russia must instead understand that nuclear first-use however limited, will fail to achieve its objectives, fundamentally alter the nature of a conflict and trigger incalculable and intolerable costs for Moscow. Our strategy will ensure Russia understands that any use of nuclear weapons, however limited, is unacceptable.

[U.S.] strategy will ensure Russia understands it has no advantages in will, non-nuclear capabilities, or nuclear escalation options that enable it to anticipate a possible benefit from non-nuclear aggression or limited nuclear escalation. Correcting any Russian misperceptions along these lines is important to maintaining deterrence in Europe and strategic stability.

DoD and NNSA will develop for deployment a low-yield SLBM warhead to ensure a prompt response option that is able to penetrate adversary defenses. This is a comparatively low-cost and near-term modification to an existing capability that will help counter any mistaken perception of an exploitable 'gap' in U.S. regional deterrence capabilities.⁸

⁸ 2018 Nuclear Posture Review, 30-31, 55. Emphasis added.

The 2022 NPR carries forward and broadens this concern over limited nuclear use by the adversary. It also underscores that decisions to commit U.S. conventional force increasingly will hinge on whether the United States can deter such adversary nuclear escalation:

The capability to deter limited nuclear attacks is critical given that some competitors have developed strategies for warfare that may rely on the threat of nuclear escalation in order to terminate a conflict on advantageous terms. The ability to deter limited nuclear use is thus key to deterring non-nuclear aggression. If we are not confident we can deter escalation, it will be more difficult for our leaders to make the decision to project conventional military power to protect vital national security interests – and far more dangerous to do so should that decision be made.⁹

In short, deterrence requires constant vigilance against competitors' attempts to seek escalatory advantage. From time to time, this may require U.S. and Allied force posture adjustments to close any gaps along the spectrum of conflict that Moscow or others may believe exist. As the 2022 NPR notes, "Deterring Russian limited nuclear use in a regional conflict is a high U.S. and NATO priority."¹⁰

NATO still needs U.S. nuclear weapons in theater, Alliance consultations on their posture and employment, and resilient command and control.
As observed during the Cold War:

A fundamental paradox exists that produces an argument for NATO's nuclear weapons, regardless of the conventional force balance. If NATO conventional force levels are lower than those of the Warsaw Pact, then NATO must have nuclear weapons and a lower threshold than the Warsaw Pact for the use of nuclear weapons in order to provide credible deterrence and adequate

⁹ 2022 *Nuclear Posture Review*, 7.

¹⁰ *Ibid.*, 5.

defense against a possible conventional attack by the Warsaw Pact. However, *if NATO improves its conventional forces to a level of parity or superiority relative to the Warsaw Pact, then the Warsaw Pact would probably have a lower nuclear threshold than NATO, and NATO needs nuclear weapons to deter a possible Warsaw Pact nuclear attack.*”¹¹

Against nearly all Cold War expectations, the Warsaw Pact no longer exists and NATO has achieved conventional superiority over Russia. This has drastically lowered the Alliance’s reliance on nuclear weapons. Nonetheless, and as anticipated in the late-1970s, Russia appears to have lowered its threshold for using nuclear weapons in theater. Thus, NATO has an enduring, if paradoxical need to retain a theater nuclear capability – not because nuclear weapons are required to offset its own conventional weakness but to deter, and if called upon respond to, Russian theater nuclear use.

Consonant with that enduring need, Alliance nuclear consultation remain vital, not least with respect to non-nuclear synchronization in a changed security environment. NATO’s Nuclear Planning Group (NPG), the senior body on nuclear matters within the Alliance, retains its importance in this regard, as it features the participation of all Alliance members save France, which keeps its nuclear deterrent outside of formal NATO planning. Chaired by the NATO Secretary General, the NPG is solely responsible for nuclear concept development and doctrine, including approval of SACEUR nuclear concepts and doctrine. As NATO takes up nuclear-conventional synchronization anew, the NPG will be a key driver, although other organizations in the Alliance may have important roles to play. This includes, for example, the Norfolk, Virginia-based Allied Command Transformation (ACT), which is responsible for NATO non-nuclear concept development and doctrine but also has staff providing military advice on nuclear strategy, policy, and posture to ACT HQ. ACT also has overall responsibility for NATO’s Centers of Excellence, including the one for Joint CBRN Defense, located in the Czech Republic. ACT has been tasked by the Alliance Military Committee to develop an

¹¹ Colonel Wayne L. Tyler, USAF, “Nuclear Survivability of Tactical Nuclear Forces: An Evaluation of Alternatives,” *Air War College Research Report*, No. 507, April 1978, 11-12. Emphasis added.

initial concept for Multi-Domain Operations.¹² This initiative may serve as a springboard to explore the potential synergies among NATO's nuclear and non-nuclear forces across the domains of air, land, sea, cyberspace, and space and help build an Alliance consensus on synchronization. Indeed, the head of NATO's Nuclear Policy Directorate recently noted in June 2023 that ACT was beginning to integrate nuclear deterrence into its thinking.¹³ To further bridge the historic divide between nuclear and non-nuclear planning within NATO, it may be necessary to create an *ad hoc* committee on synchronization within the Alliance structure.¹⁴

Of course, for NATO's deterrent to remain credible its nuclear command, control, and communications (NC3) system must keep pace with advances in an array of technologies and techniques that an adversary could exploit in a crisis or conflict to undermine it (see below). The NPR commits the United States to a more resilient next-generation NC3 architecture, one that has integrated planning and operations built in.¹⁵ No less should be expected of NATO NC3 modernization.

Our European allies remain concerned about nuclear warfighting. In trying to find the right balance between conventional and nuclear forces during the Cold War, the United States was constrained by our allies' conflicting anxieties. As a group of U.S. Army and Air Force officers observed in 1984:

On the one hand, many Europeans [believe] that one of the greatest dangers facing the Alliance today is the decoupling of U.S. strategic nuclear guarantees from the defense of Europe. While

¹² "Multi-Domains Operations Conference – What are We Learning?" Allied Command Transformation, April 8, 2022, <https://www.act.nato.int/articles/multi-domains-operations-lessons-learned>.

¹³ Jessica Cox, Twitter, June 22, 2023, https://twitter.com/Cox_NukePol/status/1671926275160657922?ext=HHwWhMC-mdmF8LMuAAAA.

¹⁴ Author conversation with former senior British official

¹⁵ 2022 *Nuclear Posture Review*, 22.

most Europeans...recognize the need for improved conventional forces to make flexible response credible, many suspect that the U.S. intention in pushing hard for such improvement is driven less by a desire to strengthen NATO's threat to escalate a conflict if necessary, than to avoid a nuclear [use] decision altogether. On the other hand, some Europeans believe that the new U.S. concepts of deep attack may call for both nuclear and conventional capability, thereby leading to plans for the use of nuclear weapons in a warfighting role. They find such a strategy even more frightening than the drive for a conventional-only option.¹⁶

A similar situation exists today. Allied publics are showing greater support for nuclear deterrence following the 2022 Russian invasion of Ukraine yet remain worried about the risk of nuclear escalation in the conflict.¹⁷ The notion of integrated nuclear and conventional operations by NATO is seen in some European quarters as making nuclear use more likely.¹⁸

While European elites and publics reassess their level of support for nuclear deterrence, the United States continues to provide that link between theater and strategic nuclear forces; some would say blurring the line between the two. In 2018, the U.S. Air Force began rotating strategic bombers to Europe on so-called Bomber Task Force (BTF) missions. In 2020, U.S. SSBNs first began deploying with the W76-2

¹⁶ Boyd Sutton, John R. Landry, Malcom B. Armstrong, Howell M. Estes, and Wesley K. Clark, "Strategic and Doctrinal Implications of Deep Attack Concepts for the Defense of Central Europe," in Keith A. Dunn and William O. Staudenmaier, eds., *Military Strategy in Transition: Defense and Deterrence in the 1980s* (Boulder, CO: Westview Press, 1984), 66-67.

¹⁷ See, for example, Michal Onderco, Michal Smetana, and Tom W. Etienne, "Hawks in the Making? European Public Views on Nuclear Weapons Post-Ukraine," *Global Policy* 14, no. 2 (May 2023): 305-317, <https://onlinelibrary.wiley.com/doi/epdf/10.1111/1758-5899.13179>.

¹⁸ See, Christine Parthemore, "The Problem of Blurring Conventional and Nuclear Deterrence," in *Perspectives on Nuclear Deterrence in the 21st Century*, Beyza Unal, Yasmin Afina and Patricia Lewis, eds., Chatham House Research Paper, April 2020, <https://www.chathamhouse.org/sites/default/files/2020-04-20-nuclear-deterrence-unal-et-al.pdf>. See also, Lukasz Kulesa, "The Future Of Deterrence: Effectiveness and Limitations of Conventional and Nuclear Postures," in *New Perspectives on Shared Security: NATO's Next 70 Years*, Tomas Valasek, ed., Carnegie Endowment for International Peace, 2019, https://carnegieendowment.org/files/N_TO_int_final1.pdf.

low-yield ballistic missile warhead.¹⁹ The bombers and the SSBNs are clearly strategic platforms; their employment in a European conflict would carry risks of escalation. That is the deterrent effect intended on the Kremlin and is both welcomed and dreaded by different segments of European society. These are the tensions with which today's warfighte must contend.

Anxiety over nuclear war still factors in European domestic politics.

West European fears about the potential for nuclear war in Europe were first aroused in the mid-1950s by press reports of NATO nuclear exercises and the enormous civilian casualties that would result on Alliance territory. These fears were then stoked by the Kremlin, which began providing material and political support to the West European peace movement in the hopes of preventing NATO deployment of the neutron bomb in the late 1970s (which was effective) and the Pershing II and GLCMs in the early 1980s (which was not).²⁰

Today, European activists are using social media to heighten fears of nuclear use and pressure NATO members to disarm unilaterally by joining the 2017 Treaty on the Prohibition of Nuclear Weapons (TPNW), a treaty that no nuclear weapons possessor has yet signed. Russia undoubtedly finds such activism useful, as it helps to disrupt NATO unity. Whether Moscow is abetting today's anti-nuclear campaign remains to be seen. Certainly, the opportunities for Russian malign influence and anonymity are increasing, as a recent study warns:

Advances in digital technology, from deep fakes to AI-enabled social media campaigns, are transforming the speed and precision with which influence campaigns can reach and manipulate their desired targets. Adversaries can amplify effects, obscure attribution, and prime the information space to their advantage long before a crisis begins, as well as shape it during such a crisis.

¹⁹ John Rood, Undersecretary of Defense for Policy, Statement on the Fielding of the W76-2 Low-Yield Submarine Launched Ballistic Missile Warhead, Department of Defense, February 4, 2020.

²⁰ "Soviet Involvement in the West European Peace Movement," CIA, undated (circa 1982-1983), approved for release 2007/10/19.

By promoting false narratives, flooding the information zone with conflicting data points, manipulating social and economic institutions, and instigating general or targeted social unrest, potential adversaries can break confidence in U.S. and allied institutions, increase distrust and confusion, and coerce desirable outcomes at lower levels of conflict²¹

Today's warfighter must anticipate efforts by disarmament activists and Russia to raise and exploit European anxiety about nuclear war. U.S. and NATO public communication about their nuclear exercises must avoid the mistakes of 1950s exercises such as CARTE BLANCHE.

Operational

At the level of military operations, a number of similarities between Cold War and present-day nuclear-conventional synchronization endure. As with the strategic level, however, there are some notable twists.

NATO and Russia retain dual-capable weaponry in theater. NATO has maintained uninterrupted since the 1950s the ability to conduct conventional or nuclear missions with land-based tactical aircraft. Russia likewise has retained DCA but, in contrast to NATO, also kept and enhanced its ground- and sea-based options for delivering conventional or nuclear weapons (see below).

The transition from conventional to theater nuclear operations could occur rapidly. Soviet doctrine emphasized early and decisive use of nuclear weapons in a war with NATO. This posed enormous challenges to NATO planning for an initial non-nuclear defense. Some wishful thinking by the Alliance ensued, which proved controversial and inhibited real conventional-nuclear synchronization, as observed in a 1980 study:

²¹ Hersman, *op. cit.*, 95.

To ease the doctrinal dilemma, an assumption was made that warning of the use of tactical nuclear weapons would be received in time to provide a transition period during which NATO forces could assume a "nuclear" posture which would increase their survivability and prospect of being able to continue fighting effectively. Soviet doctrine provides for no such transition, and the notion that there will be such a period is highly suspect. This assumption, however, allowed planners to separate, artificially, conventional warfare from tactical nuclear warfare and place the latter on a very low backburner.²²

For the study authors, the implications were clear:

[W]ith the absence of a period of transition from "conventional" to "tactical nuclear" warfare...measures for control and survival must be essentially common to all operations, be they conventional, chemical, nuclear, or any combination thereof. This, basically, is the Soviet view: it should also be adopted by the U.S. and NATO. We feel that "mirror-imaging" in this case is totally appropriate and required.²³

With today's drive for integration across the domains and the spectrum of conflict the possibility of rapid, non-linear escalation to the nuclear level is real. Already, experts are warning that Russia could employ a non-strategic nuclear weapon in Ukraine without tipping off Western intelligence.²⁴ Thus, while Russia maintains the ability to introduce nuclear weapons rapidly into a theater conflict, NATO conventional and

²² Richard I. Wiles, Reed E. Davis, Jr., Herbert T. Casey, and William R. Kraft, Jr., *A Net Assessment of Tactical Nuclear Doctrine for the Integrated Battlefield*, ORI, Inc., September 1, 1980, 11-12. Hereafter, ORI.

²³ Ibid., 98.

²⁴ Because Russian dual-capable delivery systems are ubiquitous, one U.S. official posited that, "we're probably not going to know" much in advance of Russian nuclear use in Ukraine. See Bryan Bender, "U.S. Steps Up Intel, Surveillance After Putin's Nuke Threats," *Politico*, September 27, 2022, <https://www.politico.com/news/2022/09/27/putin-nuke-russia-ukraine-intel-surveillance-00059020>.

nuclear planning remains artificially segregated²⁵ potentially slowing the ability to send important deterrence signals and/or generate potential Alliance nuclear response options. The challenge for today's warfighter increasingly is to work across the conventional-nuclear planning and operational divide, ask the hard questions about how to recover from Russian limited nuclear use in theater, and start putting in place the associated signaling strategies and mitigation measures.

The survivability of NATO theater nuclear forces remains critical. In the late 1970s, DoD was increasingly concerned about the survivability of NATO's theater nuclear capability. Among the concepts being studied by DTRA²⁶ and others was accelerated nuclear weapon dispersal.²⁷ As NATO's theater nuclear force has shrunk since the end of the Cold War, the survivability of individual weapons and delivery platforms has taken on added importance. NATO appears cognizant of this risk and is giving more attention to DCA survivability.²⁸ Deeper study may be required by today's warfighter to address NATO theater nuclear survivability in the face of emerging technologies.

Nuclear awareness among U.S. and Allied forces remains low. Early in the Cold War, lack of nuclear awareness among troops, airmen, and sailors was a function of the highly classified/comparted nature of atomic weapons information. As a 1980 study observed:

²⁵ For instance, "Steadfast Noon," NATO's annual deterrence exercise, is a stand-alone air operation; conventional ground or naval forces are not involved. See "NATO's Annual Nuclear Exercise Gets Underway," NATO Press Release, October 14, 2022, https://www.nato.int/cps/en/natohq/news_208399.htm. See also Kingston Reif, "NATO Weighs Nuclear Exercises," *Arms Control Today*, November 2015, <https://www.armscontrol.org/act/2015-11/news/nato-weighs-nuclear-exercises>.

²⁶ DTRA's forerunner, the Defense Nuclear Agency, was directed to manage DoD's Theater Nuclear Forces Survivability, Security and Safety (TNF S3) program. See *Transition Briefing Book*, Defense Nuclear Agency, Undated/Declassified, 13. Available at: https://www.esd.whs.mil/Portals/54/Documents/FOID/Reading%20Room/Other/Carter_Reagan_Transition-6.pdf.

²⁷ "Planning U.S. General Purpose Forces: The Theater Nuclear Forces," *Budget Issues Paper*, Congressional Budget Office, January 1977, 14-15

²⁸ Jacek Durkalec, "NATO Strategy to Counter Nuclear Intimidation," in Andrea Gilli, ed., "Recalibrating NATO Nuclear Policy," *NATO Defense College Research Paper*, No. 10, June 2020, 9.

In the early 1950s NATO accepted the deployment of U.S. tactical nuclear weapons to balance what was perceived to be an overwhelming [Warsaw] Pact conventional threat to Western Europe...so little was revealed to NATO commanders (and even to U.S. troop commanders) about the capabilities, limitations and planned employment of these weapons that planning and training at the tactical level ignored the problems implicit in the use of these weapons. Subsequently, planning to take advantage of the potential of tactical nuclear weapons was seriously inhibited.²⁹

As more information was made available to the military, it developed a cadre of nuclear weapons experts. It also sought to raise the nuclear awareness of the rank and file through the military education system, training, and exercises. As noted earlier, efforts to raise nuclear awareness varied across the services and generally waned after the shift to Flexible Response. The military's ranks of nuclear experts have been deeply depleted in the post-Cold War era, and the nuclear awareness of U.S. and NATO personnel has greatly atrophied, too; not because of secrecy but rather institutional de-emphasis. Nuclear awareness among today's warfighter may well be on par with that of the early-1950s, which means the implications of nuclear employment are probably neglected in planning and training at the tactical level and conventional-nuclear synergies remain unrealized.

Conventional and nuclear forces are still complementary. In the mid-1970s, DoD explicitly recognized that the three legs of the "NATO Triad" (i.e., conventional forces, theater nuclear forces, and strategic nuclear forces) were:

...complementary and strengthened by the others. An important example is the mutual support of conventional and theater nuclear forces. [Warsaw Pact] conventional air and ground forces would

²⁹ ORI, 11.

likely have to mass to penetrate NATO defenses successfully. However, NATO theater nuclear forces deter this massing, thus enhancing NATO conventional defense capabilities.³⁰

The underlying assumption of Russian forces massing on the territory of East European countries prior to assaulting NATO is less relevant today, with the possible exception of Belarus. Now that Russia's direct border with NATO has expanded from Norway to include Finland, Estonia, and Latvia (not to mention Poland and Lithuania bordering the Russian exclave of Kaliningrad), it is more likely that Russia would be massing conventional attack forces within its homeland where it could be confident that NATO would not strike with nuclear or conventional forces prior to hostilities. Thus, the more appropriate contemporary example of conventional-nuclear complementarity may be where NATO's theater nuclear forces provide the umbrella under which its conventional forces could mass for a counter-attack to dislodge Russian forces on Alliance territory.

Another enduring form of complementarity is the contribution by certain NATO members of conventional air assets to help ensure that the Alliance's DCA can penetrate heavy defenses and hold key targets at risk – so-called Support of Nuclear Operations with Conventional Air Tactics (SNOWCAT). SNOWCAT operations have been planned by NATO since the late-1950s.³¹ They continue to provide participating countries a means of sharing the Alliance nuclear burden short of deploying their own DCA.

³⁰ Secretary of Defense James R. Schlesinger, *The Theater Nuclear Force Posture in Europe: A Report to the United States Congress in compliance with Public Law 93-365*, April 1, 1975, 16. Declassified.

³¹ Kjølv Egeland, "Spreading the Burden: How NATO Became a 'Nuclear' Alliance," *Diplomacy and Statecraft* 31, no. 1 (2020): 151. Available at: <https://hal-sciencespo.archives-ouvertes.fr/hal-03455910/document>.

In this era of Integrated Deterrence,³² it is incumbent upon today's warfighter to seek nuclear/non-nuclear synergies across the domains and with our allies. Indeed, the 2022 NPR issues a call to action in this regard:

Non-nuclear capabilities may be able to complement nuclear forces in strategic deterrence plans and operations in ways that are suited to their attributes and consistent with policy on how they will be employed. A pragmatic approach to integrated deterrence will seek to determine how the Joint Force can combine nuclear and non-nuclear capabilities in complementary ways that leverage the unique attributes of a multi-domain set of forces to enable a range of deterrence options backstopped by a credible nuclear deterrent. Developing the needed operational and organizational concepts will take time and require additional research, evaluation, and experience. *This will be a focus of NPR and NDS implementation.*³³

3. What's Different About Nuclear-Conventional Synchronization Today?

Strategic

Important developments in technology, competitive strategy, and practice at the national and multi-national level complicate how we conceive and pursue nuclear-conventional synchronization today. Some important ways in which today's synchronization differs from that of the Cold War are discussed below.

³² According to DOD, integrated deterrence "entails developing and combining our strengths to maximum effect, by working seamlessly across warfighting domains, theaters, the spectrum of conflict, other instruments of U.S. national power, and our unmatched network of Alliances and partnerships." See *Fact Sheet: 2022 National Defense Strategy* (Unclassified). See also Paul Bernstein, "Toward an Integrated Strategic Deterrent," in Brad Roberts, ed., *Fit for Purpose? The U.S. Strategic Posture in 2030 and Beyond*, Center for Global Security Research, Lawrence Livermore National Laboratory, October 2020, 75.

³³ 2022 *Nuclear Posture Review*, 10. Emphasis added.

The United States will need to deter two major nuclear powers simultaneously. Throughout the Cold War, China's nuclear forces remained quite small, with about only 20 single-warhead ICBMs capable of reaching the continental United States (CONUS) as late as 2002.³⁴ As such, China's nuclear threat was long considered a "lesser included" deterrence problem compared to the Soviet Union.³⁵ In 2021, however, the Pentagon reported that China was building hundreds of new ICBM silos with as many as 200 ICBM warheads capable of threatening the United States by 2026.³⁶ As the 2022 NPR underscored, "[China] likely intends to possess at least 1,000 [total] deliverable warheads by the end of the next decade.... [Thus, b]y the 2030s the United States will for the first time in its history face two major nuclear powers as strategic competitors and potential adversaries. This will create new stresses on stability and new challenges for deterrence."³⁷

³⁴ *2002 Annual Report on the Military Power of the People's Republic of China*, 27. Available at https://permanent.fdlp.gov/lps24358/2002/2002_report.pdf.

³⁵ Statement of Charles A. Richard, Commander, United States Strategic Command, Before the Senate Committee on the Armed Services, 20 April 2021, <https://www.armed-services.senate.gov/imo/media/doc/Richard04.20.2021.pdf>.

³⁶ *Military and Security Developments Involving the People's Republic of China 2021*, Annual Report to Congress, Office of the Secretary of Defense, 61-62, <https://media.defense.gov/2021/Nov/03/2002885874/-1/-1/0/2021-CMPR-FINAL.PDF>.

³⁷ *2022 Nuclear Posture Review*, 4.

What is more, both China and Russia have a “head start” on the contemporary integration of nuclear and non-nuclear planning, force posture, and training.³⁸ Indeed, Russian military thought since the 1960s has always emphasized conventional-nuclear synchronization. The challenge for today’s warfighter is to flesh out expeditiously what Integrated Deterrence means for the Joint and Allied force. Our warfighters will have to do more while navigating challenges that they are “copying” Chinese and Russian strategy – a tactic of civil society groups wary of any lowering of the nuclear use threshold.

NATO’s membership has doubled since the end of the Cold War.

Beyond the re-unification of East and West Germany in October 1990, NATO has accepted fifteen new members since the end of the Cold War. Spurred by Russia’s war of aggression against Ukraine – which Moscow alleges was necessary to prevent Kyiv from also joining NATO and the European Union – Finland and Sweden are the latest to join NATO, bringing the Alliance to thirty-two members, twice its Cold War size. As a decision-making body that continues to operate by consensus, this doubling in membership brings added complexity to Alliance military planning, including the synchronization of nuclear and non-nuclear operations. Some members, particularly those geographically closer to Russia (e.g., Poland) could be quite enthusiastic about nuclear-conventional synchronization – or “coherence” in NATO parlance³⁹ – in their larger quest for greater integration with the U.S. military. Other members could be rather resistant, perhaps because of long-segregated national nuclear and conventional planning (e.g., the UK) or fear of being seen as lowering NATO’s nuclear use threshold (e.g., Germany), however misguided that perception of synchronization may be. Getting to consensus on nuclear-

³⁸ See, for example, Dave Johnson, “Russia’s Conventional Precision Strike Capabilities, Regional Crises, and Nuclear Thresholds,” *Livermore Papers on Global Security* No. 3, Lawrence Livermore National Laboratory, Center for Global Security Research, February 2018, <https://cgsr.llnl.gov/content/assets/docs/Precision-Strike-Capabilities-report-v3-7.pdf> and Michael S. Chase and Arthur Chan, *China’s Evolving Approach to “Integrated Strategic Deterrence,”* RAND, 2016, https://www.rand.org/content/dam/rand/pubs/research_reports/RR1300/RR1366/RAND_RR1366.pdf.

³⁹ In its latest Strategic Concept, NATO commits to “take all necessary steps to ensure the credibility, effectiveness, safety and security of the nuclear deterrent mission. The Alliance is committed to ensuring greater integration and coherence of capabilities and activities across all domains and the spectrum of conflict, while reaffirming the unique and distinct role of nuclear deterrence.” *NATO 2022 Strategic Concept*, 8.

conventional synchronization within the Alliance will take time (see below). As previously noted, ACT's efforts to develop an initial NATO concept for multi-domain operations offers a natural focal point to do so.

Indo-Pacific allies want greater participation in the nuclear mission.

During the Cold War, the United States chose not to replicate the NATO approach in the Indo-Pacific. Still to this day, neither Japan, South Korea, nor Australia maintain joint nuclear planning mechanisms or nuclear sharing arrangements similar to NATO. Instead, these allies rely exclusively on bilateral dialogues with the United States designed to discuss regional security, alliance defense postures, nuclear and missile defense policies, as well as exchange views to deepen mutual understanding on alliance deterrence. However, these allies have grown increasingly concerned that such measures are no longer sufficient given the deteriorating threat environment. For instance, South Korea's President Yoon Suk Yeol recently stated in an interview that such approaches are simply outdated. "What we call 'extended deterrence' means that the United States will take care of everything, so South Korea should not worry about.... But now, it is difficult to convince our people with just this idea."⁴⁰ Commentators in all three Allied nations have called for the potential for nuclear sharing arrangements and greater insight into the nuclear planning process with the United States, particularly as Washington asks its Allies to take on a larger burden in alliance defense and deterrence. This suggests an opportunity to augment these relationships with expanded conventional-nuclear synchronization efforts. How such efforts take shape will likely differ significantly from those in Europe, not least because of the geographical differences between the two theaters.

Escalation is more complex and non-linear. In the early-1980s, SACEUR expected NATO's defenses to hold out against Warsaw Pact conventional forces only for a matter of days before he would need to request authorization to use nuclear weapons.⁴¹ NATO was concerned that

⁴⁰ William Gallo, "U.S. Not Discussing Nuclear Exercises with South Korea, Biden Says," *Voice of America*, January 2, 2023, <https://www.voanews.com/a/yoons-south-korea-discussing-nuclear-exercises-/6900423.html>.

⁴¹ Barry James, "New Deep-strike Strategy for NATO?" *UPI*, December 2, 1984.

Soviet forces might also employ chemical and biological weapons; many even believed that the Pact would simply begin the conflict with nuclear weapons. Nonetheless, mainstream Alliance planning reflected a basic conceptual “ladder” of escalation from conventional to nuclear warfare, along the lines popularized by RAND strategist Herman Kahn in 1960. Today, the notion of an escalation ladder is called into question:

Unlike traditional concepts of escalation, which suggest linear and somewhat predictable patterns from low-level crisis to all-out nuclear war, escalatory pathways in this new era of strategic competition will be less predictable. Indeed, increasingly sophisticated sub-conventional tactics such as disinformation and weaponized social media, the blurring of nuclear-conventional firebreaks and the continuing diffusion of global power to regional nuclear states are adding new challenges and additional complexity to crisis management even as an increasingly competitive and contested security environment fuels greater coercive risk-taking among nuclear-armed states, in particular, the United States, Russia, and China.⁴²

This concern is reflected in the 2022 *Nuclear Posture Review*:

...advances in non-nuclear capabilities, including in the cyber, space, air, and undersea domain...likely will create complex and unpredictable pathways for conflict escalation, especially where collective experience, common understandings, and established norms are lacking.⁴³

As indicated above, NATO efforts to improve conventional-nuclear cohesion will be key targets in a Russian disinformation campaign. This is so for two reasons. First, the Kremlin has long understood that nuclear issues are

⁴² Hersman, *op. cit.*, 91.

⁴³ 2022 *Nuclear Posture Review*, 6.

contentious in Europe and will look to synchronization as a wedge to disrupt NATO unity. Second, the Russian military recognizes that a more integrated NATO force structure is a more formidable force structure and will use the various sub-conventional means at its disposal to impede it. Thus, NATO must anticipate this resistance and be prepared, for example, to refute social media charges that it is lowering the nuclear threshold.

More broadly, greater use of war gaming will be needed. Properly structured and facilitated, cross-domain war games will help today's warfighte better understand how quickly escalation can occur and the new forms it could take. The aim of such war gaming also should be to identify ways and means to limit the potential for undesirable escalation, exploit escalation when necessary or unavoidable, and generally improve adaptive planning skills.

Co-mingled warning and command and control systems could undermine nuclear stability. During the Cold War, NATO relied on special communications to convey emergency action messages (EAM) to nuclear custodial units in wartime.⁴⁴ The Alliance's nuclear command and control system also overlapped to a degree with its broader command and control system. In particular, SACEUR's Control Alerting and Reporting System (SCARS II), which allowed SACEUR directly to issue nuclear release orders to relatively low command levels, rode on the Initial Voice Switched Network (IVSN) and Telegraph Automatic Relay Equipment (TARE).⁴⁵ To make communication networks more resilient and cost effective, increasing emphasis generally is being placed on co-mingling conventional and nuclear command and control systems. This trend has potential implications for nuclear stability:

Today...most nuclear-armed states are...integrating many of their early warning, command-and-control, and surveillance capabilities across conventional and nuclear missions.... States have strong incentives to target command, control, warning, and surveillance

⁴⁴ Shaun H. Gregory, *Nuclear Command and Control in NATO* (London: MacMillan Press, 1996), 97.

⁴⁵ Ibid., 45, 99.

systems early in a crisis in order to ensure conventional dominance, which will also threaten nuclear-related systems whether intentionally or unintentionally.⁴⁶

The challenge for planners and decision makers alike will be to understand how the compromise or loss of co-mingled command and control systems might inadvertently lead us or an adversary to escalate – for fear that its “nuclear” command and control was under attack – and identify mitigation measures to reduce that risk. Among the possible modalities are discussions on the subject with Russian and Chinese military official within strategic stability dialogues, to ascertain each side’s views on the subject and work toward common understandings that will lower the risk of inadvertent escalation.

The legitimacy of U.S. nuclear command and control may be at risk due to adversary information operations. Early in the Kennedy Administration, some U.S. military commanders became skeptical of the authorization chain for tactical nuclear weapons – not because of technical concerns about the integrity of the command and control system but because of political misgivings that the President would ever release those weapons due to perceived risks of escalation. Apart from these self-doubts, it does not appear that Soviet information operations ever sought to call into question the legitimacy of U.S. nuclear command and control. It was more likely that Moscow focused its efforts on simply trying to destroy the system in the event of war.⁴⁷ Today, both technology and its novel application open up new possibilities to compromise nuclear command and control well below the kinetic threshold:

⁴⁶ Hersman, *op. cit.*, 101-104.

⁴⁷ The notion that Soviet strategic nuclear forces were configured for decapitation of the U.S. nuclear command structure in the 1960s is explored in Ernest R. May, John D. Steinbruner, and Thomas W. Wolf, *History of the Strategic Arms Competition 1945-1972, Part II*, Alfred Goldberg, ed., Office of the Secretary of Defense, Historical Office, March 1981, 654-668. Declassifi

Disinformation campaigns by adversaries who seek to sow public distrust in the command and control system itself can focus on softer targets accessible through less well-defended networks to erode confidence in systems and architectures without targeting or disabling those systems directly.... Amplification of adversary messaging through conspiracy theorists and automated bots as well as the strategic use of deep fakes are just a few examples of how the new age of information warfare could disrupt secure and reliable presidential decisionmaking.⁴⁸

Contemporary planning for synchronized conventional-nuclear operations will likely have to contend with issues taken for granted in the past, namely, both military ranks and the public at large may have to be reassured of the integrity and legitimacy of the U.S./NATO nuclear chain of command in the face of social media-fueled conspiracy theories instigated by our adversaries.

The Russian threshold for theater nuclear use is lowering. In 1982, the Soviet Union espoused a nuclear no-first use (NFU) policy. This was rightly seen at the time as a propaganda ploy designed to pressure NATO to forego Pershing II and GLCM deployments.⁴⁹ The pledge was never taken seriously by the Alliance. That left NATO planners debating whether the Warsaw Pact would open a war with a nuclear strike or limit itself to conventional means. In any event, Moscow officially dropped its NFU policy in 1993, as it grappled with the dissolution of the Pact and the further weakening of Russian conventional forces. The embarrassing performance of the Russian military in the Ukraine War likely exacerbates Moscow's insecurities and reliance on theater nuclear weapons. The overall trend in Russian policy statements since the end of

⁴⁸ Ibid., 97.

⁴⁹ Serge Schmemmann, "Russia Drops Pledge of No First Use of Atom Arms," *New York Times*, November 4, 1983.

the Cold War is that Moscow could resort to nuclear weapons in situations where conventional attacks threaten the integrity of the Russian state – an ambiguous and seemingly low threshold.⁵⁰

What lends credibility to Russia's lowering of the nuclear threshold is the nature of today's force balance. Even though the total number of NSNWs in Europe has come down drastically since the Cold War, Moscow, as mentioned, retains an order of magnitude advantage over NATO. Each side's conventional forces also are far lower than their Cold War peak. While the force levels are lower, the stakes are just as high – tens of tactical nuclear weapons could be as devastating as the higher numbers deployed during the Cold War, if not more, given NATO's increased urban density and smaller conventional force posture. In short, Russia might only need to use a few nuclear weapons to wreak havoc on NATO's conventional defenses while retaining such an overmatch in NSNWs that the Alliance could see little sense in employing its own NSNWs. This is the challenge confronting today's warfighte – how to work around Russia's low bar to nuclear use and ultimately help induce Moscow to raise it.

NATO use of nuclear weapons is increasingly remote. From its very formation, NATO expected to use nuclear weapons in the event of hostilities with the Soviet Union. The Alliance's Strategic Concept, revised in 1957, noted:

Since NATO would be unable to prevent the rapid overrunning of Europe unless NATO immediately employed nuclear weapons both strategically and tactically, we must be prepared to take the initiative in their use.⁵¹

⁵⁰ Michael Kofman and Anya Loukianova Fink, "Escalation Management and Nuclear Employment in Russian Military Strategy," *War on the Rocks*, September 19, 2022, <https://warontherocks.com/2022/09/escalation-management-and-nuclear-employment-in-russian-military-strategy-2/>.

⁵¹ *Final Decision on MC 14/2* (Revised), A Report by the Military Committee on Overall Strategic Concept for the Defense of the North Atlantic Treaty Area, May 23, 1957, 9.

That is far from the case today. Essentially repeating language from its 2010 Strategic Concept, NATO stated in its June 2022 Strategic Concept that, “The circumstances in which NATO might have to use nuclear weapons are extremely remote.”⁵² This judgment is predicated, in part, upon the shifting of some nuclear missions to conventional forces and contrasts with Russia’s aforementioned lowering of its nuclear use threshold. That the NATO position was restated even after President Putin’s February 2022 nuclear threats underscores the deep political commitment within the United States and NATO not to increase the saliency of nuclear weapons in the Alliance’s defense posture. The challenge for today’s warfighter thus is to find the political space to conduct the planning and training needed to improve the cohesion of NATO’s nuclear and non-nuclear forces. This will likely entail advising political leaders that it is the *balance* of conventional force resiliency and the prospect of a nuclear response that will best deter Russian use of nuclear weapons in a theater conflict

Operational

As with the strategic level, there are important dissimilarities at the level of military operations between the Cold War and today’s nuclear-conventional synchronization environment.

NATO’s theater nuclear capability, unlike Russia’s, lacks diversity. During the Cold War, virtually every major conventional weapon system in the U.S. arsenal also had the ability to deliver a nuclear weapon. At the extreme end of this spectrum was the Davy Crockett recoilless gun, whose short-ranged nuclear warhead would have imperiled the troops who launched it, hastening its removal from Europe in the late-1960s. In the 1970s, NATO forces still were equipped to deliver nuclear artillery shells, surface-to-surface rocket and missile warheads, anti-submarine depth bombs, surface-to-air missile warheads, and gravity bombs (see Table 6).

⁵² NATO 2022 Strategic Concept, 7.

NUCLEAR SYSTEMS DEPLOYED IN EUROPE

	1971	1981	1987	1991	1999	2003
• Mines	x	x				
• Nike Hercules SAM	x	x	x			
• Honest John SSM	x	x				
• Lance SSM	x	x	x	x		
• Sergeant SSM	x					
• Pershing IA	x	x	x			
• Pershing II			x			
• GLCM			x			
• 155mm Howitzer	x	x	x	x		
• 8-inch Howitzer	x	x	x	x		
• Walleye ASM	x					
• ASW Depth Bombs	x	x	x	x		
• DCA Bombs	x	x	x	x	x	x
Total Systems	11	9	9	5	1	1

Table 6: NATO Nuclear Systems Deployed in Europe over Time. From “NATO’s Nuclear Forces in the New Security Environment,” *NATO Issues*, June 4, 2004.

Today, NATO has two main nuclear delivery systems: DCA equipped with U.S. gravity bombs and SLBMs aboard U.S. and UK SSBNs. U.S. strategic bombers capable of delivering nuclear-armed cruise missiles or gravity bombs have been forward deployed in Europe occasionally (and could, of course, fly missions non-stop from the continental United States). Development of a new nuclear-armed sea-launched cruise missile is now underway with estimated delivery in the 2030s.⁵³ NATO, for its part, has stated its members have no interest in deploying new land-based missiles in Europe, although the United States and Germany have reached a bilateral agreement to rotate long-range, non-nuclear missiles through Germany beginning in 2026.⁵⁴

⁵³ Anya L. Fink, *Nuclear-Armed Sea-Launched Cruise Missile (SLCM-N)*, Congressional Research Service, July 19, 2024, <https://crsreports.congress.gov/product/pdf/IF/IF12084>.

⁵⁴ NATO declared in June 2021, “We have no intention to deploy land-based nuclear missiles in Europe.” *Brussels Summit Communique*, NATO, June 14, 2021. See also, *Joint Statement for United States and Germany on Long-Range Fires Deployment in Germany*, The White House, July 10, 2024, <https://www.whitehouse.gov/briefing-room/statements-releases/2024/07/10/joint-statement-from-united-states-and-germany-on-long-range-fires-deployment-in-germany/>

This lack of nuclear delivery options contrasts with Russia's theater nuclear posture. As a U.S. official recently remarked, some two dozen Russian weapon systems can deliver both conventional and low-yield nuclear weapons, "That's everything from cruise missiles to nuclear torpedoes to gravity bombs to intermediate-range ballistic missiles."⁵⁵ This means that NATO's theater nuclear posture is less flexible than Russia's. The Alliance simply has fewer in-theater means of delivering nuclear effects and thus presents the adversary with less planning dilemmas. In this era of heightened nuclear saliency, it is prudent for warfighter to ask whether NATO has sufficient nuclear options at its disposal and whether the space and cyber domains might be able to deliver "nuclear-like" effects on the adversary.

NATO DCA readiness is low compared to the Cold War. At the height of the Cold War, a portion of NATO pilots sat in their cockpits on "Victor Alert," ready to launch their nuclear-armed fighter-bombers within 15 minutes. In the years since the end of the Cold War, NATO drastically reduced the readiness of its DCA capability. In the early-2000s, this readiness was measured in months (see Figure 7).

Today, NATO no longer specifies its state of DCA readiness⁵⁶ but apparently, there are no DCA on QRA. U.S. and UK SSBNs remain on constant patrol, however. (France also maintains SSBNs at sea but they are not integrated with NATO's command structure.) The potential implications of this DCA posture are worrisome. Were escalation to occur, for example, due to a spillover of the war in Ukraine or a struggle for power in Moscow, NATO could find itself with quite limited and undesirable nuclear response options. In light of the ongoing conflict in Ukraine, President Putin's nuclear threats, and the recent rebellion by the Wagner mercenary group,⁵⁷ today's warfighter need to reassess NATO's DCA readiness against the new demands of rapid and non-linear escalation.

⁵⁵ Bender, *op. cit.*

⁵⁶ As of July 2022, NATO noted that its DCA "are available for nuclear roles at various levels of readiness." See "NATO's Nuclear Deterrence Policy and Forces," NATO, July 6, 2022, https://www.nato.int/cps/en/natohq/topics_50068.htm. The NATO 2022 Strategic Concept makes no reference to DCA readiness.

⁵⁷ See, for example, "West Explores Nuclear Risks From Unstable Putin Regime," *Financial Times*, June 26, 2023, <https://www.ft.com/content/35b0291b-5d02-4869-851b-a1de4080c5f6>.

NUMBERS AND READINESS LEVELS OF NATO'S DUAL-CAPABLE AIRCRAFT

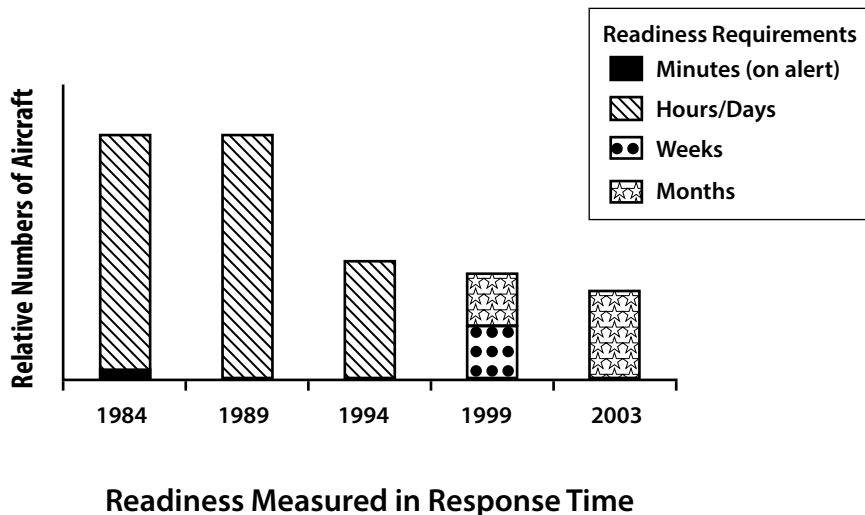


Figure 7: NATO DCA Readiness over Time. From “NATO’s Nuclear Forces in the New Security Environment,” *NATO Issues*, June 4, 2004.

NATO now has a BMD capability. The state of technology and the belief among many Western defense specialists that missile defenses were de-stabilizing meant that anti-tactical ballistic missiles (ATBMs) did not begin to emerge until very late in the Cold War. In 1988, Patriot surface-to-air missiles, non-nuclear successors to the Nike-Hercules, received software upgrades that enabled them to intercept short-range ballistic missiles such as the Soviet SS-21. It was not until the early-2000s, however, that Iran’s missile and nuclear programs prompted NATO to consider deploying a defense against longer-range missiles. In July 2016, NATO achieved an initial operational capability to defend its southeastern area from potential ballistic missile attack.⁵⁸ BMD is now one of NATO’s permanent missions.

For years, NATO has sought to reassure Moscow that its BMD has no bearing on Russia’s *intercontinental-range* ballistic missiles — that is,

⁵⁸ “Ballistic Missile Defense,” NATO, January 26, 2022, https://www.nato.int/cps/en/natohq/topics_49635.htm.

its strategic nuclear deterrent. President Putin's latest nuclear threats and potential spillovers from the war in Ukraine may well cause the Alliance to re-examine its ability to defend against Russian *theater-range* ballistic missiles.⁵⁹ Efforts to adapt NATO BMD in this direction could contribute additional non-nuclear means with which to deter and defend against limited Russian nuclear use.⁶⁰ This is not to suggest that BMD offers today's warfighter a "solution" to Russian theater-range missile threats, which also include cruise missiles. NATO itself acknowledges that, "missile defense can complement the role of nuclear weapons in deterrence; it cannot substitute for them."⁶¹ Nonetheless, a creative and integrated approach to conventional and strategic surveillance and command and control might open up new counterforce possibilities. Today's warfighter will have to balance these possibilities against the risk that such integration might erode the traditional firewall between conventional and nuclear operations, to the detriment of escalation management.

More capabilities and domains mean greater integration complexity but also more synergy/substitution potential. Integration during the Cold War largely revolved around a more discrete planning problem – better harmonizing conventional and nuclear aspects of deterrence and military operations. This aimed to both shape Soviet risk calculations, as well as achieve U.S. campaign objectives following nuclear attack. Today, nuclear forces are increasingly intertwined with a broader and more sophisticated array of non-nuclear systems in ways that could result in complex and uncertain conflict dynamics. In some cases, senior leaders may have little appreciation for how modern strategic capabilities – alone and together – could affect considerations related to

⁵⁹ An early call in that direction comes from Marcin Andrzej Piotrowski, "NATO Missile Defense in the Context of Russia's War with Ukraine," *Spotlight*, No. 68/2022, March 2022, Polish Institute of International Affairs, <https://www.pism.pl/publications/nato-missile-defence-in-the-context-of-russias-war-with-ukraine>. See also Sidharth Kaushal and Matthew Harries, "Russia's Options for Theatre Missile Coercion," *Commentary*, Royal United Services Institute, June 19, 2023, <https://rusi.org/explore-our-research/publications/commentary/russias-options-theatre-missile-coercion>.

⁶⁰ See Justin Anderson and Lieutenant Colonel James R. McCue, USAF, "Deterring, Countering, and Defeating Conventional-Nuclear Integration," *Strategic Studies Quarterly* 15, No. 1 (Spring 2021): 44-45, https://www.airuniversity.af.edu/Portals/10/SSQ/documents/Volume-15_Issue-1/Anderson.pdf.

⁶¹ "Ballistic Missile Defense."

conflict thresholds, kinetic and non-kinetic effects, proportionality, and escalation. As such, the interplay between and among nuclear, cyber, space, advanced information and intelligence, precision strike, and missile defense capabilities may exacerbate the prospect for miscalculation and misperception. Despite these challenges and risks, integration across this toolkit also offers unprecedented opportunities to strengthen deterrence and defense. Here, greater forethought into nuclear and non-nuclear complementarity can help create new dilemmas for the opponent while providing expanded options for U.S. decision-makers to better manage escalation risks. If such synergies can be knitted together and leveraged dynamically, the result may also provide viable alternatives to the use of nuclear weapons in certain circumstances. Until recently, such issues have only been treated at the academic level, leaving ample work for the Department of Defense.

Greater acceptance of “Jointness.” Throughout the Cold War, each service independently developed its own doctrine to address nuclear-conventional integration, largely free of higher-level scrutiny. Thus, outside of strategic nuclear targeting, there was little joint nuclear-conventional planning of which to speak. Even within USEUCOM, each service component was largely poised to fight its own version of a theater nuclear war. Despite the inherent need for coordination, nuclear-conventional synchronization rarely rose above inter-service rivalry. By 1986, however, the Goldwater-Nichols Department of Defense Reorganization Act expanded and strengthened the statutory role of the CJCS. This allowed, for the first time, the Chairman to develop doctrine for the joint employment of the armed forces, including doctrine for joint nuclear operations. Indeed, *Joint Publication 3-12, Doctrine for Joint Nuclear Operations*, was the first joint doctrine developed for nuclear operations, and even included a small section dedicated to integrated operations though the document itself was not published until after the Cold War in 1993.⁶² The emergence and institutionalization of joint doctrine provides a stronger foundation for *inter-service* synchronization of nuclear and non-nuclear planning than was available to previous generations. While the services still develop their own doctrine, joint military guidance has a unique contribution to make with respect to contemporary nuclear-

⁶² Joint Chiefs of Staff, *Doctrine for Joint Nuclear Operations*, JP 3-12 (Washington, DC: Joint Chiefs of Staff, 1993), III-1-6.

conventional synchronization in terms of lowering barriers between the services via Joint Professional Military Education (JPME, see below), development of joint doctrine on the subject, and reviewing plans for synchronization content. Geographic combatant commanders likewise have a critical contribution to make by driving the requirement for synchronization and building synchronization into plans. Indeed, significant headway recently has been made in raising the awareness of combatant commanders in this regard. It is critical that this new thinking be sustained by the JCS, the combatant commands, and the services, among others, and inculcated into subordinate levels of command. Military planners will need to take into account these enduring and new features of the security environment as they contemplate how best to take forward nuclear-conventional synchronization.

4. How to Take Forward Nuclear-Conventional Synchronization to Meet the Needs of Today's Warfighter

U.S. defense strategy and planning today accepts the need to synchronize concepts and capabilities across domains, combatant command areas of responsibility, and alliances in order to achieve greater payoffs and military advantage.⁶³ Greater cohesion of conventional and nuclear force planning is but a subset of this overarching trend. Nonetheless, to improve the prospects of deriving the hoped-for benefit of synchronization, it is necessary to understand its shortcomings during the Cold War and design to overcome them.

U.S. synchronization of nuclear and conventional planning during the Cold War did not achieve its full potential for a variety of reasons. Each service went about the business of integrating NSNWs on its own. This led to uneven development and application of concepts, highly disruptive experiments, and poor inter-service and allied coordination. For all its complexity, the services did not invest sufficient intellectual capital in synchronization, preferring to allocate much of their top talent to fighting each other for budget share. Because of their unique political ramifications

⁶³ *Fact Sheet: 2022 National Defense Strategy* (Unclassified)

and classification of design parameters, the services confine NSNW expertise to small cadres in organizational stovepipes. This impeded the raising of nuclear awareness across the rank and file. Indeed, it encouraged perceptions that “nuclear” was someone else’s problem and therefore did not need to be reflected in day-to-day plans and operations.⁶⁴ By contrast, Soviet doctrine emphasized nuclear-conventional integration and had clear advantages over NATO in this regard.

NATO efforts to integrate NSNW also lacked consideration of domestic political sensitivities, and the public that was supposed to be reassured by extended nuclear deterrence was horrified by NATO nuclear exercises. This called into question the legitimacy of nuclear deterrence and hamstrung Alliance efforts to keep pace with the Soviet Union. In time, a perception took hold that the implications of the nuclear battlefield were just “too big” to solve. Today’s nuclear-conventional synchronization must do better in these regards, in part by taking the steps outlined below.

Leverage Cold War thought leadership. A retired USN officer recently summed up the challenge facing his service:

[A]n entire generation of naval personnel have entered the service, served, and retired since the last U.S. Navy tactical nuclear weapon went to sea. This means thinking about these issues cannot depend on a store of internalized, shared experience, developed doctrine, and strategic and operational best practices. The historical record is not everything, but getting ahead of new-old realities will require

⁶⁴ As the Army itself observed in 1977, “Historically, the Army’s technical procedures for employing nuclear weapons and high security classification of weapon characteristics have caused commanders to relegate the nuclear aspects of the battlefield to the [nuclear specialist] ‘prefix types’ while retaining the conventional planning for themselves and their principal staffs. *This should not be the case.*” United States Army Nuclear Agency, “A Primer on Nuclear Weapons Capabilities,” *Nuclear Notes Number 6*, June 1977, 1. Emphasis in the original.

careful review of what came before. This is especially germane since there exist fairly analogous strategic, doctrinal, political, operational, and technical precedents to be considered.⁶⁵

While the Army has retained a small cadre of FA52 specialists, much the same could be said about that service's "muscle memory" when it comes to operating on a nuclear battlefield. Regardless of whether the Navy and the Army reacquire tactical nuclear capabilities of their own, *all* warfighter must ready themselves for the new integrated battlespace.

Fortunately, as this study attests, today's warfighter do not start with a blank canvas. Of the many Cold War-era works cited, some stand out as particularly trenchant in providing broad concepts and practical approaches to addressing today's synchronization challenges:

- Colonel Maddrey A. Solomon, USA, "Dispersion is 'Not' the Answer," *Military Review* 31, no. 3 (June 1951).
- Brigadier General William F. Train, USA, "The Atomic Challenge," *Military Review* 36, no. 8 (November 1956).
- BDM Corporation, *Concept for Theater Integrated Nuclear/Nonnuclear Operation*, 30 October 1979.
- Captain Linton F. Brooks, USN, "Escalation and Naval Strategy," *Proceedings* 110, no. 8 (August 1984).
- Commander James John Tritten, USN, "(Non)Nuclear Warfare," *Proceedings* 113, no. 2 (February 1987).
- USAF Deputy Directorate of Advance Planning, "National Policy on Conflict Management," November 1964
- Colonel Robert H. Reed, USAF, "On Deterrence: A Broadened Perspective," *Air University Review* 26, no. 4 (May-June 1975).

⁶⁵ Commander Paul S. Giarra, USN (Retired), "Time to Recalibrate: The Navy Needs Tactical Nuclear Weapons...Again," *Proceedings* 149, no. 7 (July 2023), <https://www.usni.org/magazines/proceedings/2023/july/time-recalibrate-navy-needs-tactical-nuclear-weapons-again>.

Doubtless, other Cold War analyses – classified and unclassified – remain untapped in this regard. This study serves as a call to contemporary analysts to dig deeper into the archives, to include service doctrines and field manuals, to avoid past mistakes while building on Cold War synchronization concepts that showed promise.

Apply the best intellectual resources. For all the Cold War similarities/dissimilarities, nuclear-conventional synchronization remains a “wicked problem.” As noted, senior U.S. military leaders have lamented that the services’ brightest thinkers were not applied to the problem during the Cold War. We should not repeat that mistake. While still complex, certain aspects of the current threat environment suggest synchronization is relatively more manageable now. It will take the sharpest minds to determine if that is true and to make sense of contemporary integration in any event. As one expert warned in the early 1980s:

[T]he services must spur professional interest in nuclear conflict. Too easily have they allowed this vital branch of professional knowledge to atrophy. Tactical nuclear war will pose the greatest challenge U.S. forces have ever faced. To do less than have the best minds available attempting to anticipate and solve its formidable problems invites disaster and defeat.⁶⁶

We must therefore encourage thought leadership and collaboration on the full range of synchronization issues. For instance, *The Maritime Strategy* was innovative in postulating that the application of conventional force against a portion of an adversary’s strategic nuclear forces could help deter conflict or its escalation. The strategy was not without risk or critics. Nonetheless, fresh thinking about creative ways in which conventional and theater nuclear forces could be mutually supportive is needed, including an assessment of potential risks, mitigation measures, and applicability across domains.

⁶⁶ Lieutenant Colonel Jerry M. Sollinger, USA, “Improving US Theater Nuclear Doctrine: A Critical Analysis,” *National Security Affairs Monogram Series* 83-3, 1983, National Defense University, 55.

The services and our allies should begin now to identify top talent and develop plans to harness it for synchronization-related initiatives, pulling in a balanced fashion from all corners (e.g., the Joint Professional Military Education (JPME) community, contractors, think tanks, academia) and all ranks, stimulated, for example, by a Chairman of the Joint Chiefs of Staff JPME “area of emphasis,” synchronization conferences, and calls for papers.

Establish a joint and allied framework for synchronization. The Cold War demonstrated that no single service is able to “solve” nuclear-conventional synchronization. Moreover, since America typically fight with the backing of allies, no single nation can solve it either. Thus, the United States must demonstrate synchronization leadership and commitment and bring our allies and partners along, as called for in the NDS and NPR. “Integrated Deterrence” provides a suitable overarching concept, but taking forward nuclear-conventional synchronization will require a joint and allied framework of its own. That framework should characterize the contemporary synchronization problem and lay out a pathway for addressing it, defensively and offensively. This includes assessment of nuclear threats at the theater level, our current ability to deal with them through a variety of means, development of a forward-looking synchronization concept, and its migration to joint and allied doctrine. OSD, the Joint Staff, USEUCOM, U.S. Indo-Pacific Command, U.S. Strategic Command, and U.S. Special Operations Command (USSOCOM), among others — all have critical roles to play in this regard.

From the outset, factor in a public communications strategy. The U.S. military conducted early Cold War nuclear-conventional synchronization experiments and field exercises to show skeptics that it could adapt the enormous destructive effects of nuclear weapons to the traditional battlefield. In some cases, these experiments were so scripted as to have no semblance of realism. In other cases, the pervasive simulated use of nuclear weapons produced such high notional body counts as to horrify the populations it was supposed to protect — particularly in West Germany. Nuclear-conventional synchronization remains a politically sensitive topic, especially in Europe, as noted. A communications strategy to reassure allied publics of the rationale underpinning synchronization must be on the *front end* of planning efforts, not a last-minute — or worse, *ex*

post facto — exercise in damage control. Failure to ameliorate public concern, particularly in Europe, will jeopardize allied investment in synchronization. A major challenge for NATO will be trying to improve the cohesion of its nuclear and non-nuclear forces without being seen as “copying” Russian doctrine. In a sense, this is a problem of NATO’s own making. It has repeatedly said that it will not match Russia “tit-for-tat” in deploying new nuclear missiles or making nuclear threats. While reassuring perhaps to disarmament lobbies in Europe, such a stance serves to box in the Alliance’s strategic options.

A recent study offers useful guidelines for how to avoid stigmatization of synchronization within NATO:

Conventional forces must possess some demonstrable ability to operate in a nuclear hazard environment, and those planning NATO military operations must possess the means to adapt operations as needed. Operational resilience – forces, infrastructure, and plans – to limited nuclear attacks is vital to deterring such attacks. [This] is not a call for NATO to return to its Cold War playbook or to mimic the Russian approach. NATO publicly reaffirms in the 2018 Brussels Summit Declaration that nuclear weapons would fundamentally alter the nature of a conflict and the circumstances in which NATO might consider the use of nuclear weapons are extremely remote. Modest improvements to the Alliance’s strategies, plans, and posture do not suddenly eliminate this longstanding pledge, nor will it encourage NATO in the direction of normalizing nuclear weapons.

If NATO were truly mimicking or mirror-imaging Russia, it would take actions to expand the role and usefulness that nuclear forces play in NATO policy. This would include a significant expansion of the arsenal’s size and diversity, plans for early nuclear use or prolonged nuclear exchanges to support military campaigns, and the use of nuclear weapons for coercive political purposes. [Conventional-Nuclear] Alignment promotes none of these ideas, and is focused squarely on enhancing stability and credibility

without making dramatic changes to NATO's nuclear posture that would move the Alliance down the path that Russia has taken.⁶⁷

In sum, an effective public communications strategy for NATO entails emphasizing what synchronization is *not*.

Raise awareness of CBRN threats across the Joint and Allied Force.

CBRN awareness among the services varied considerably over the span of the Cold War. Raising it to meet the contemporary theater-level threat will require new thinking. This is because the cadre of CBRN specialists has shrunk dramatically since the end of the Cold War, reliance on specialists may itself be an outmoded concept, and new teaching and training tools are becoming available.

In expanding CBRN expertise across the services, boosting nuclear expertise is a top priority. For instance, Army officers responsible for assisting combatant commands with nuclear planning, Functional Area 52s (Nuclear and Counter Proliferation), seem to be in particularly short supply. In Fiscal Year 2021, the Army authorized just seven FA52s in Europe (five in Germany, two in Belgium).⁶⁸ Special emphasis in personnel policy, training, and education will be needed to boost the number of FA52s to meet the growing demand at home and abroad.

As noted, reliance on specialist cadres during the Cold War had the undesirable effect of discouraging the rank and file from taking CBRN threats seriously. To avoid repeating this pattern, more innovative approaches will be needed to build CBRN awareness across the force. Calls for *all* officers to be educated in the essentials of nuclear weapons employment date to 1960.⁶⁹ Similarly, in the mid-1950s, USAREUR established atomic warfare training that prescribed standards of proficiency each individual was to have at his level of responsibility and

⁶⁷ Harrison Menke, "Aligning the Nuclear and Conventional Elements of NATO's Deterrence," in Andrea Gill, *op. cit.*, 26-27, <https://www.ndc.nato.int/news/news.php?icode=1446>.

⁶⁸ "FA52 Authorizations FY21," United States Army, <https://talent.army.mil/wp-content/uploads/2020/10/FA52-Auth-map.pdf>.⁶

⁶⁹ Freed, *op. cit.*, 64.

identified specific responsibilities each staff section would have in the event of atomic attack.⁷⁰ In implementing the NDS and NPR, the services would do well to revisit these approaches.

Typically, increasing CBRN training would mean having to cut back in other areas. However, cutting-edge simulation tools may help lessen those tradeoffs. For example, the Army is presently developing cross-function synthetic training environments that “will give students and CBRN soldiers at units more chances to practice their craft.”⁷¹ Such synthetic environments hold the potential to make training more efficient thereby expanding the envelope of access. Immersing trainees in realistic yet virtual CBRN threat environments could help underscore why preparedness is everyone’s responsibility in ways that traditional and perfunctory lectures cannot.

Cultural shifts also will be needed. As recently observed:

The Army may need to develop a mindset across the force that ensures soldiers both in the field and in garrison are constantly thinking about how they could counter CBRN attacks. That’s because the CBRN threat doesn’t recognize MOS [military occupational specialty] codes. And the disruptive effect to logistics and support units may be even greater if an enemy uses one of these weapons against formations far from the front line.⁷²

For Assistant Secretary of Defense for Nuclear, Chemical, and Biological Defense Deborah Rosenblum, the challenge is clear, “We can have the best material in the world, but if culture and mindset are not integrated...it’s going to sit on the side.”⁷³

⁷⁰ Carter, *op. cit.*, 264-266.

⁷¹ Todd South, “As the Army Pivots to Battle Peers, Chemical, Biological Threats Loom,” *ArmyTimes*, October 12, 2022, <https://www.armytimes.com/home/2022/10/12/as-the-army-pivots-to-battle-peers-chemical-biological-threats-loom/>.

⁷² Ibid.

⁷³ Quoted in *ibid.*

Anticipate the demands of sustained conventional operations on the nuclear mission and vice versa. Potentially, the Air Force could find itself in an analogous situation to the B-52 bomber force during the Vietnam War — that is, where strategic dual-capable bombers become so heavily engaged in a conventional conflict that their contribution to the strategic nuclear deterrence mission is degraded for some number of years. This possible dislocation of strategic bombers takes on added significance in a world where the United States has to deter two major nuclear powers simultaneously. To avoid such a recurrence, the Joint Staff, Air Force, Navy, and the Combatant Commands should take a fresh look at B-52 operations during Vietnam and “stress test” plans for the B-21 bomber fleet and, by implication, the ICBM and SLBM legs of the triad. Vice versa, pro-longed periods of nuclear alert (e.g., due to adversary nuclear threats) could put stress on the dual-capable (e.g., F-35) and conventional forces supporting nuclear missions, reducing their availability for non-nuclear operations. This, too, should be stress tested.

Conduct a synchronization net assessment. It has been perhaps forty years since the last serious effort was made to compare NATO and Russian abilities to operate on a nuclear battlefield.⁷⁴ A new net assessment is in order, preferably one that also could be disseminated in an unclassified form to help raise nuclear awareness. It should be informed by lessons learned from the anticipated versus actual performance of the Russian military in Ukraine. Such a net assessment ought to address doctrine, offense-defense trade-offs, command and control, training, logistics, and decontamination, among other aspects, as outlined below.

Doctrine. A rigorous net assessment conducted in 1980 concluded that:

⁷⁴ ORI, *op. cit.* The study benefitted from comments received from CGSC, USAREUR, V and VII U.S. Corps, and others. In June 2019, RAND completed a study for the U.S. Army on a broader set of issues that compared U.S. and NATO strengths and weaknesses vis-à-vis Russia. See Clint Reach, Edward Geist, Abby Doll, and Joe Cheravitch, “Competing with Russia Militarily: Implications of Conventional and Nuclear Conflicts,” *Perspective*, RAND, June 2021, <https://www.rand.org/pubs/perspectives/PE330.html>. The full study has not been released publicly.

Soviet/Pact forces possess doctrinal advantages in all major aspects of "tactical nuclear" warfighting. Given a war in which the Pact fights in accordance with Soviet nuclear doctrine, the prospect of NATO defeat is somewhere between quite possible and probable.⁷⁵

The ongoing Russian war against Ukraine offers important insights for a synchronization net assessment. Apart from wrecking civilian infrastructure, the Russian military has been underperforming in virtually all aspects of operations against Ukraine, revealing deficiencies in doctrine, command and control, and other areas. At the same time, analysts caution that this was not the fight the Russian military had been preparing for, which was the force-on-force battle against NATO. It also remains the case that Russia is withholding from the fight in Ukraine critical forces that would be needed to confront NATO.⁷⁶

Regardless, the crucible of Ukraine will have a major impact on Russian military doctrine for years to come. Given the staggering losses of men and armor, it may well force Russia to rely even more heavily on NSNW. On the defensive, this suggests a nuclear "trip-wire" strategy of the kind adopted by NATO in the 1950s, where outnumbered conventional forces act as a light defensive screen before early and heavy use of NSNW is invoked. On the offensive, Russian doctrine might revert to that of the 1960s where operations against NATO would *commence* with heavy nuclear employment. Given that the Russians themselves will likely still be grappling with the lessons of Ukraine, a new synchronization net assessment will need to consider a range of possible Russian doctrines for theater nuclear use.

Offense-defense trade-offs. Deciding where to invest the balance of synchronization efforts and resources hinges, in part, on where we are most at risk and where our strengths reside. As posited in 1980:

⁷⁵ ORI, *op. cit.*, 93.

⁷⁶ "Russia's Army is in a Woeful State," *The Economist*, April 30, 2022, <https://www.economist.com/briefing/how-deep-does-the-rot-in-the-russian-army-go/21808989>

It has been suggested that forward deployed forces are less at nuclear risk than those in the rear. Should less emphasis be placed on protection of forward forces? If NATO has an assured capability to target continually and eliminate Soviet operational-tactical delivery means, can protection of forces against nuclear strikes be de-emphasized?⁷⁷

In today's terms, do NATO's latest intelligence, surveillance, and reconnaissance (ISR) capabilities, conventional strike systems, and a smaller post-Cold War Russian theater nuclear force translate into a viable conventional counter-force capability for the Alliance? To the point that the Alliance could invest less on protection of NATO forces against Russian theater nuclear use? How much less and where? How do NATO's integrated air and missile defenses factor into these calculations?

Command and Control. During the Cold War, it was noted that:

With respect to communications support, the vulnerabilities to electronic warfare (EW) means and EMP are nearly in balance between the opposing forces. However, Soviet/Pact emphasis on communications discipline, extensive use of EW, a somewhat lesser dependence on electronic communications, and the nuclear hardening of key command posts/communications gear provide the Soviet/Pact forces an advantage [over NATO] in communications support.⁷⁸

In today's contested cyber domain, command and control faces a more pronounced disinformation challenge, as recently pointed out:

Disinformation campaigns employed in conjunction with other political or military actions can seek to distract decision-makers and slow their response time enough to confer a tactical or operational advantage during a crisis. The United States needs to think more about

⁷⁷ ORI, *op. cit.*, 136.

⁷⁸ Ibid., 92.

how to maintain situational awareness across the information ecosystem in a crisis to sustain the legitimacy and reliability of its NC3 systems and protect presidential decision-making in the event of such tactics.⁷⁹

How resilient is command and control in today's NATO? Is it adequately hardened against nuclear weapons effects? Is it up to the challenges of today's disinformation environment?

Training. If militaries fight as they train, the Warsaw Pact appeared to be better prepared for the integrated battlefield than was NATO. As noted in 1980:

Soviet writings and current intelligence reports indicate that considerable emphasis is given to training Soviet/Pact commanders, staff officer and troops for tactical operations in a conventional/nuclear/chemical environment. In contrast, U.S./NATO training borders on being perfunctory.... Neglected in [NATO] training are the manifold demands which tactical operations in this environment will place on the command and control of maneuver forces, communications, the protection of troops, equipment and field installations, mass casualty evacuation and treatment, other combat service support, unit reconstitution and individual soldier performance. Major shortfalls exist across the board.... This dichotomy is a major asymmetry between U.S./NATO and Soviet/Pact forces.⁸⁰

In light of the surprisingly poor performance of Russian troops in the Ukraine war, U.S. intelligence assessments of Russian military effectiveness have been called into question.⁸¹ A new assessment of Russian synchronization skills should be informed by the intelligence

⁷⁹ Hersman, *op. cit.*, 97.

⁸⁰ ORI, *op. cit.*, 68.

⁸¹ See, for example, David Rothkopf, "How Russia's War Revealed Blind Spot in U.S. Intelligence," *Daily Beast*, April 1, 2022, <https://www.thedailybeast.com/how-the-us-intelligence-community-blew-it-with-russia>.

lessons learned from the Ukraine conflict and more closely scrutinize “soft” indicators of military effectiveness, such as training.

Logistics. In the 1980s, U.S. Army doctrine and organization for combat service support (CSS) were in flux and generally ill-suited to the integrated battle. A close inspection revealed, *inter alia*:

- A concentration of supplies in the corps area that reduced the mobility in corps combat support units and increased vulnerability to attack
- A concentration of maintenance units in the division support area that invited attack by conventional as well as nuclear and chemical weapons
- Insufficient transportation assets to support heavy demands even in a conventional war
- Medical units ill equipped for entering and performing emergency medical treatment and evacuation in contaminated areas, as well as, inadequate training in the treatment of CBRN mass casualties
- Neither the development nor testing of a brigade support area postured for survival on the integrated battlefield

In short, “Training of supply units at all levels is based on the assumption of a non-nuclear environment. The vulnerability of typical supply operations as now conducted in brigade, division, and corps field exercises should be of concern.... A major vulnerability to essential CSS support in Europe is the reliance on host nation transport for the dispersal and delivery of prepositioned war reserve stocks.”⁸²

⁸² Information in this paragraph is drawn from ORI, *op. cit.*, 41-49.

The questions for today's logisticians and warfighter are manifest. To what extent are current logistics constructs based on the assumption of a non-nuclear environment? Is the logistics support system able to cope with losses of troops and materiel commensurate with limited use of nuclear weapons in theater? How quickly can logistics recover from limited nuclear strikes against the resupply system itself? What are the impacts of CBRN degradation of the logistics system to the war fight? What practical steps can be taken to make theater logistics more resilient against limited nuclear attacks?

Decontamination. During the 1980s, it was found that:

[U.S. Army] Doctrine and procedures for decontamination of personnel, equipment, and facilities are well documented in field and technical manuals. However, current organic capabilities fall far below the level of anticipated need during the conduct of operations on the integrated battlefield ...

[In contrast, e]quipment for forward decontamination is found in greater abundance in Soviet/Pact forces than is provided in U.S./NATO forces, and it is used during training exercises. [Therefore, a]dditional survivability measures must also be undertaken. In the longer term, these might include providing intrinsic radiation and chemical protection in combat vehicles, more effective collection and dissemination of radiological information, better troop training encountering nuclear weapons effects, and improved individual protective equipment.⁸³

⁸³ Ibid., 48-100.

After a brief resurgence of interest in chemical-biological defense in the 1991 Iraq War, Army CBRN skills once again atrophied, as the focus shifted to counter-insurgency operations in the early 2000s.⁸⁴ The return of great power competition has given new impetus to development of CBRN defenses. New gear is in the pipeline to help address lingering issues, such as the Uniform Integrated Protective Ensemble, “a full body undergarment that adds another layer of CBRN protection beneath the standard chemical suit, while also using cooling materials to reduce overheating common in legacy gear.”⁸⁵ As investment in CBRN increases, it will be important to balance detection and decontamination needs. Along these lines, what is the anticipated need for decontamination of personnel, equipment, and facilities? How much of that need can be met by organic resources? How much depends on external reinforcement?

Propose practical measures to redress synchronization shortfalls.

Nuclear use on the battlefield or at sea has long been recognized by the U.S. military as the most complex of planning and operational challenges. Indeed, many would argue that it proved “too hard” and thus was largely ignored. By 1980, it seemed that the military’s approach to conventional warfare was too deeply ingrained to accommodate significant nuclear impacts; therefore, synchronization failed:

Concern [about Soviet theater nuclear capabilities in the late 1950s] led to studies and some testing of ways to cope with this new threat.... While it was generally agreed that the logical approach to reasonable survivability lay in dispersion of troops and support facilities, decentralization of command and control, and redundancy of communications and command centers, these and other measures appeared to curtail conventional capability to such an extent that these force structure changes had little chance of being adopted.⁸⁶

⁸⁴ See the Foreword by Brigadier General Daryl O. Hood, CBRN Commandant, USA, in *Chemical, Biological, Radiological, and Nuclear Platoons*, ATP 3-11.74, Headquarters, Department of the Army, April 2021.

⁸⁵ South, *op. cit.*

⁸⁶ ORI, *op. cit.*, 11-12.

Today's warfighte does not approach nuclear-conventional synchronization with a blank slate; the Cold War provides useful insights, including pitfalls to be avoided. The warfighte needs not only to help identify synchronization areas in need of improvement and corrective measures but to set an agenda with discrete goals for achieving greater conventional and nuclear cohesion for the services and our Allies and partners. Key questions in this regard include the following:

- Is the problem of limited Russian, Chinese, or North Korean nuclear use still “too big” for U.S. and Allied conventional force postures to handle? Are the necessary adjustments too demanding and therefore unlikely to be adopted?
- Is there an incremental approach to synchronization that stands a better chance of adoption?
- Does synchronization today have any greater chance of success than during the Cold War?
- What are the risks to the United States and its allies of synchronization failure?

Plan for a synchronization learning curve. Because we have allowed our CBRN expertise to atrophy over the years, building back an appreciation for it given the new security environment will take time – within the services, the combatant commands, and with our allies. In fostering a more pragmatic and digestible approach to synchronization as suggested above, we also should be realistic about learning curves. During the Cold war, it was noted:

[T]he Alliance's usual learning curve...is the eighteen to twenty-four month period it usually takes the allies, and especially the European states, to absorb new information and to refashion American positions to their own domestic political requirements.... This does not ensure final decision or even agreement with positions

developed by the United States. But it clearly lowers both the anxiety level of official and challengers alike, and leads to a more expert discussion within governments and among allies.⁸⁷

As noted above, our European allies have particular sensitivities when it comes to the synchronization of nuclear and conventional military planning. We would be remiss in underestimating the challenges in moving such synchronization forward within NATO. At the same time, President Putin's continuing use of nuclear threats in his war against Ukraine underscores the importance of doing so, and as noted, recent polls show a new-found appreciation for the forward deployment of U.S. NSNWs in Europe. All this suggests that the time is ripe to engage our NATO allies more deeply on the subject, recognizing an inevitable learning curve while also aiming to compress it where possible through sustained dialogue at all levels.

Continue to build on the accomplishments of the U.S. military and NATO. Even in the absence of an agreed definition of nuclear-conventional integration or synchronization, the services, commands and other DOD components have been moving ahead in their thinking about the subject.⁸⁸ For instance, the Air Force has been developing a Capstone integration concept.⁸⁹ Since 2017, the Army has implemented "Multiple-Domain Operations" as its top-level doctrine, which notes:

U.S. nuclear capabilities are foundational to the deterrence of adversary weapons of mass destruction use. To ensure the

⁸⁷ Catherine McArdle Kelleher, "Nuclear-Conventional Tradeoffs: The Debate in Europe," in Keith A. Dunn and William O. Staudenmaier, *Military Strategy in Transition: Defense and Deterrence in the 1980s* (Boulder, CO: Westview Press, 1984), 88.

⁸⁸ Giles, *op. cit.*

⁸⁹ Rachel S. Cohen, "USAF Rethinks Relationship Between Conventional, Nuclear Weapons," *Air & Space Forces Magazine*, August 19, 2020, <https://www.airandspaceforces.com/usaf-rethinks-relationship-between-conventional-nuclear-weapons/>. See also Amy Hudson, "Richard Says Nuclear Deterrence Connected to All Other DOD Capabilities," *Air & Space Forces Magazine*, May 7, 2021, <https://www.airandspaceforces.com/richard-says-nuclear-deterrence-connected-to-all-other-dod-capabilities/>.

credibility of this deterrent, joint and Army forces must integrate the planning and operations of nuclear and conventional forces. Further, Army forces must plan, train, and exercise to conduct operations under the adversary threat or use of weapons of mass destruction in order to deny the adversary any perceived advantage that might result from employing weapons of mass destruction. To do so, commanders and staffs must continuously assess, protect, and mitigate the effects of adversary chemical, biological, radiological, and nuclear (CBRN) weapons use and contamination hazards. They must train under simulated weapons of mass destruction conditions...”⁹⁰

The Army also is producing an integration training strategy and is placing FA-52s at U.S. Army Pacific and U.S. Army Europe and Africa Commands to add capacity to their respective nuclear planning teams.⁹¹ The Navy is conducting research into a new conceptual framework for nuclear-conventional integration.⁹² With support from USSOCOM, USEUCOM has developed an implementation plan to enhance its CBRN readiness over the next few years.⁹³ In June 2022, the Allies agreed to NATO’s CBRN Defense policy, “which commits the Alliance to having

⁹⁰ *Field Manual FM 3-0, Operations* (01 October 2022), 4-11 to 4-12. FM 3-0 also states that “Planning for large-scale combat operations must account for possible enemy use of chemical, biological, radiological, and nuclear (CBRN) weapons and allied retaliatory response options.... Enemy employment of CBRN weapons and the allied response would affect all domains, but they present disproportionate effects in the land domain. Some adversaries plan for the employment of nuclear and chemical weapons by incorporating them into their doctrine and training, and they maintain delivery systems for their employment on the battlefield. Furthermore, the use of these weapons does not terminate a conflict and may cause it to escalate. Units must be prepared to operate in, around, and through contaminated environments. This is fundamental to deterring adversaries from employing weapons of mass destruction. CBRN considerations should inform both operational planning and force readiness.” See 1-11.

⁹¹ Colonel Benjamin Miller, Director, USANCA, “Director Notes,” *Countering WMD Journal*, No. 22 (Spring/Summer 2021): 3.

⁹² James A. Russell and Thomas H. Johnson, *Strategy and Nuclear-Conventional Integration for the United States Navy*, Naval Postgraduate School, October 2022, <https://apps.dtic.mil/sti/pdfs/AD1186682.pdf>.

⁹³ *Statement of Vice Admiral Collin P. Green, USN, Deputy Commander, U.S. Special Operations Command Before the House Armed Service Committee, Subcommittee on Intelligence and Special Operations*, April 1, 2022, 8.

the military capabilities to operate effectively and fight and prevail in any environment.”⁹⁴ Notably, these activities acknowledge the imperative of greater synchronization yet they lack coordination and so risk replicating the mistakes of the Cold War. While these efforts are not to be discouraged, for they represent important shifts in mindsets and tangible enhancements in capability, before long they need to be woven together into true Joint and Allied concepts, doctrines, and programs.

In Conclusion

By not thinking through how to continue conventional operations in a nuclear environment and investing the resources needed to do so during the Cold War, the services effectively were gambling that conflict with the Soviet Union over Europe could remain non-nuclear, or if not, that it would escalate to all-out nuclear war rapidly, making the conventional battle moot. Either mindset entailed enormous risk and left U.S. and Allied forces and military objectives vulnerable even to limited theater nuclear employment. The Pentagon could not know in advance how the Cold War would end, nor is it any more clairvoyant in predicting when or how the current theater-level nuclear threat will recede. An observation from the height of the Cold War about synchronization continues to ring true, “The problems of fighting on a nuclear battlefield are legion, but the services can, and must, overcome them. In so doing, U.S. forces will not only be more effective, their deterrence will increase.”⁹⁵

⁹⁴ NATO, “Arms Control, Disarmament and Non-Proliferation in NATO,” August 2, 2022, https://www.nato.int/cps/en/natohq/topics_48895.htm.

⁹⁵ Sollinger, *op. cit.*, viii.

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