July–August 2015
Volume 29, No. 4
AFRP 10-1

## Senior Leader Perspectives



## Features



## Departments

# Report Documentation Page

*Form Approved*
*OMB No. 0704-0188*



| | | |
|---|---|---|
| 1. REPORT DATE<br>**AUG 2015** | 2. REPORT TYPE | 3. DATES COVERED<br>**00-07-2015 to 00-08-2015** |
| 4. TITLE AND SUBTITLE<br>**Air and Space Power Journal. Volume 29, Number 4. July-August 2015** | | 5a. CONTRACT NUMBER<br>5b. GRANT NUMBER<br>5c. PROGRAM ELEMENT NUMBER |
| 6. AUTHOR(S) | | 5d. PROJECT NUMBER<br>5e. TASK NUMBER<br>5f. WORK UNIT NUMBER |
| 7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)<br>**Air Force Research Institute (AFRI) ,Air and Space Power Journal ,155 N. Twining Street,Maxwell AFB,AL,36112** | | 8. PERFORMING ORGANIZATION REPORT NUMBER |
| 9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) | | 10. SPONSOR/MONITOR'S ACRONYM(S)<br>11. SPONSOR/MONITOR'S REPORT NUMBER(S) |
| 12. DISTRIBUTION/AVAILABILITY STATEMENT<br>**Approved for public release; distribution unlimited** | | |
| 13. SUPPLEMENTARY NOTES | | |
| 14. ABSTRACT | | |
| 15. SUBJECT TERMS | | |

| 16. SECURITY CLASSIFICATION OF: | | | 17. LIMITATION OF ABSTRACT | 18. NUMBER OF PAGES | 19a. NAME OF RESPONSIBLE PERSON |
|---|---|---|---|---|---|
| a REPORT<br>**unclassified** | b ABSTRACT<br>**unclassified** | c THIS PAGE<br>**unclassified** | **Same as Report (SAR)** | **98** | |

**Standard Form 298 (Rev. 8-98)**
Prescribed by ANSI Std Z39-18

# Strategic Deterrence for the Future

Adm Cecil D. Haney, USN


Our nation's investment in effective and credible strategic forces has helped protect our country for nearly seven decades. That proud legacy continues today as we deter adversaries and assure our allies and partners of the US commitment to collective defense, even as our security environment is more diverse, complex, and uncertain than ever.

Other states are investing in their strategic arsenals, developing or modernizing nuclear forces as well as cyber and counterspace capabilities, and thus presenting real challenges to strategic stability. Nation-states and nonstate actors are seeking asymmetric capabilities and are preparing to employ them as options for achieving

their objectives during crisis and conflict. Perhaps most troubling are trends associated with proliferation of these advanced capabilities and how mobile, hardened, and underground they have become.

Russia is investing and modernizing across all legs of its nuclear triad and is demonstrating selective compliance with international accords and treaties. Russian military operations include the illegal occupation of Crimea and ongoing activities in Ukraine as well as routine demonstrations of its strategic forces. These actions, when considered along with an active information warfare campaign of provocative rhetoric and misinformation, are clear signals for the international community.

China is also seeking regional dominance militarily and economically, and for the first time in history, its gross purchasing power recently exceeded ours.[1] China is making significant progress on land reclamation projects in the contested waters of the South China Sea in an attempt to strengthen justification for its territorial claims. Simultaneously, China is modernizing its nuclear forces, which include silo-based intercontinental ballistic missiles (ICBM), road-mobile ICBMs, and ballistic-missile submarines.

Both Russia and China are developing strategic capabilities beyond their nuclear forces and are exploiting vulnerabilities in the cyber domain. Both nations have stated their ambitions regarding counterspace capabilities that could threaten US space assets in multiple orbits. Given the international community's dependence on space, this is concerning not just to the United States but to like-minded space-faring nations that depend on unfettered access to space.

North Korea continues to advance strategic capabilities and to increase tensions with threats of more nuclear tests. It also claims to have possession of a miniaturized warhead and has been noted for parading a road-mobile ICBM KN-08 missile that it says is capable of reaching the western United States.

Iran's nuclear program remains a concern and provides an important impetus for the ongoing P5 + 1 negotiations to shut down Iran's pathway to a nuclear bomb.[2] Yet, even a successful resolution of Iran's nuclear file would not remove US concerns about other military capabilities such as its recent launch of a space platform that could be used for long-range strike, unsafe operations in the Strait of Hormuz, and increasingly sophisticated cyber attacks.

These concerns are further complicated by an operating environment flanked with violent nonstate actors, including some who have expressed desires to acquire weapons of mass destruction. Terrorist groups demonstrate through barbaric behaviors that they understand no boundaries and lack respect for international norms.

In a day-to-day context, the United States strives to deter regional aggression—specifically, military conflict. Its nine combatant commands are functionally or geographically focused and ensure that the combined posture, readiness, and partnerships enhance regional and transregional stability and deterrence efforts. My command, US Strategic Command, is unique in that it is additionally tasked with leading strategic planning and executing strategic deterrence operations. The command's primary mission is to detect and deter strategic attack against the United States and our allies and to provide military options to the secretary of defense and the president of the United States should deterrence fail. Our efforts are tailored to maximize senior leadership decision space.

While strategic deterrence is underpinned and reinforced by our nuclear capabilities, it is more than the nuclear triad. An effective twenty-first-century deterrent includes foundational intelligence, space- and ground-based radar sensors for necessary indications and warning, and systems that support national nuclear command and control. It also includes missile defense and cyber protection; a more efficient and responsive nuclear infrastructure that does not require explosive testing; the international arms control and nonproliferation regime, which includes verifiable and achievable treaties and policies; and synchronized plans that orient all of our assigned capabilities toward a common daily purpose.

US Strategic Command works its efforts very closely in coordination with other combatant commands, our interagency teams, and allies and partners to address the challenges across the spectrum of conflict. Although understanding an adversary's military doctrine and force composition is critical, it is only part of the equation. Our approach also includes emulation and war gaming so that we gain a deeper understanding of our adversaries' thought processes, perceptions, and probable next moves.

Conflict may occur along the spectrum at any point, in varying degrees of intensity, with more than one adversary, and in multiple domains. At all phases, whether in peacetime or crisis or conflict, our planning and operations are designed to deter and develop "off-ramps" to de-escalate the conflict at the lowest intensity level while dissuading our adversaries from considering the use of cyber attacks, counterspace activities, or nuclear weapons. Adversaries and potential adversaries alike must understand they cannot escalate their way out of a failed conflict; that they will not reap the benefits they seek; that our nation is prepared to manage escalation risk using a cross-domain, whole-of-government approach which may include all elements of national power; and that restraint is always the better option.

Given the diverse, complex, and uncertain world in which we live, we must ask how our nation can maintain a credible strategic deterrent for the foreseeable future. The answer to this critical question centers on how we have evolved over the decades and builds upon the groundwork done by revered strategic thinkers like Albert Wohlstetter, Bernard Brodie, Thomas Schelling, Herman Kahn, and Henry Kissinger. Their foundation for deterrence remains valid and is based on the premise of deliberate actors who consider the costs and benefits of decisions they are contemplating. To ensure that our deterrent remains effective for future generations, we must continue to apply those basic tenets of deterrence.

President Obama has directed steps that reduce the role of nuclear weapons in our national security strategy. At the same time, the president made clear in his 2009 Prague speech and on other occasions since then that as long as these weapons exist, the United States will maintain a safe, secure, and effective arsenal to deter any adversary and to guarantee that defense to our allies.[3] In 2011 the "Four Horsemen" (former secretaries of state Henry Kissinger and George Shultz, former secretary of defense William Perry, and former senator Sam Nunn) called for a similar stance.[4]

In reference to the New Strategic Arms Reduction Treaty (New START), the same four individuals stated in 2013 that "the progress in the strategic field has been considerable. Washington should carefully examine going below New START levels of warheads and launchers, including the possibility of coordinated mutual

actions. Such a course has the following pre-requisites: strict reciprocity; demonstrable verification; and providing adequate and stable funding for the long-term investments required to maintain high confidence in our nuclear arsenal."[5] In his June 2013 Berlin speech, President Obama announced his assessment that we can ensure the security of America and our allies and maintain a strong, credible strategic deterrent while reducing our deployed strategic nuclear weapons by up to one-third. He also stated his intent to seek negotiated cuts with Russia to move beyond Cold War nuclear postures.[6] However, Russia has shown little inclination to pursue such negotiations.

To prevent extreme circumstances and to ensure a safe, secure, effective, and credible strategic deterrent for the future, we must sustain and modernize our nuclear, space, and cyber forces and their associated delivery platforms—many of which have been in service far longer than was originally planned or designed. The president's fiscal year 2016 budget request calls for sizeable investments necessary to pursue our plans to fully modernize our strategic deterrent and enhance space and cyber security.[7] Through investments in the enduring deterrent and supporting infrastructure, we can maintain an effective deterrent while not developing new nuclear warheads. In the coming years, our budget strategy should continue careful and deliberate investments in strategic deterrent concepts and capabilities. This effort is critical and must match the current and future strategic security environment if we are to build upon the stable foundation that benefits us all.

As the commander of US Strategic Command, I am proud to lead the dedicated professionals, both military and civilian, whose courageous service deters our adversaries, assures our allies, and enables our democratic way of life. For seven decades, they and others before them have been the heart of our nation's strategic deterrent forces. I salute their service. ✪

## Notes

1. Mike Bird, "China Just Overtook the US as the World's Largest Economy," *Business Insider*, 8 October 2014, http://www.businessinsider.com/china-overtakes-us-as-worlds-largest-economy-2014-10.

2. The P5+1 includes the five permanent members of the United Nations Security Council (United States, United Kingdom, France, Russia, and China) plus Germany.

3. "Remarks by President Barack Obama, Hradcany Square, Prague, Czech Republic" (Washington, DC: White House, Office of the Press Secretary, 5 April 2009), http://www.whitehouse.gov/the_press_office/Remarks-By-President-Barack-Obama-In-Prague-As-Delivered.

4. George P. Shultz et al., "Deterrence in the Age of Nuclear Proliferation," *Wall Street Journal*, 7 March 2011, http://www.wsj.com/articles/SB10001424052748703300904576178760530169414.

5. George P. Shultz et al., "Next Steps in Reducing Nuclear Risks," *Wall Street Journal*, 5 March 2013, http://www.wsj.com/articles/SB10001424127887324338604578325912939001772.

6. "Remarks by President Obama at the Brandenburg Gate—Berlin, Germany" (Washington, DC: White House, Office of the Press Secretary, 19 June 2013), https://www.whitehouse.gov/the-press-office/2013/06/19/remarks-president-obama-brandenburg-gate-berlin-germany.

7. Office of Management and Budget, *Fiscal Year 2016 Budget of the U.S. Government* (Washington, DC: Office of Management and Budget, 2015), 3, 16, 45, 48–50, https://www.whitehouse.gov/sites/default/files/omb/budget/fy2016/assets/budget.pdf.

**Adm Cecil D. Haney, USN**

Admiral Haney (BS, US Naval Academy; MS, National Defense University; MS, Naval Postgraduate School) is the commander of US Strategic Command (USSTRATCOM), responsible for the global command and control of US strategic forces to meet decisive national security objectives and for providing a broad range of strategic capabilities and options for the president and secretary of defense. Before taking command at USSTRATCOM, he was commander of US Pacific Fleet and served as deputy commander of USSTRATCOM. Admiral Haney also commanded a submarine group, two submarine squadrons, three submarines, a submarine tender, and a fleet ballistic missile submarine. Additionally, he served as director of the Naval Warfare Integration Group and of the Submarine Warfare Division; deputy chief of staff of plans, policies, and requirements, US Pacific Fleet; congressional appropriations liaison officer for the Office of the Secretary of Defense (Comptroller); and administrative assistant for enlisted affairs at Naval Reactors. The admiral's decorations include the Navy Distinguished Service Medal (two awards), Defense Superior Service Medal (two awards), Legion of Merit (four awards), Navy Commendation Medal (three awards), Navy Achievement Medal (two awards), and various campaign and unit awards. In addition, he was the recipient of the 1998 Vice Admiral James Bond Stockdale Leadership Award.

**Let us know what you think! Leave a comment!**

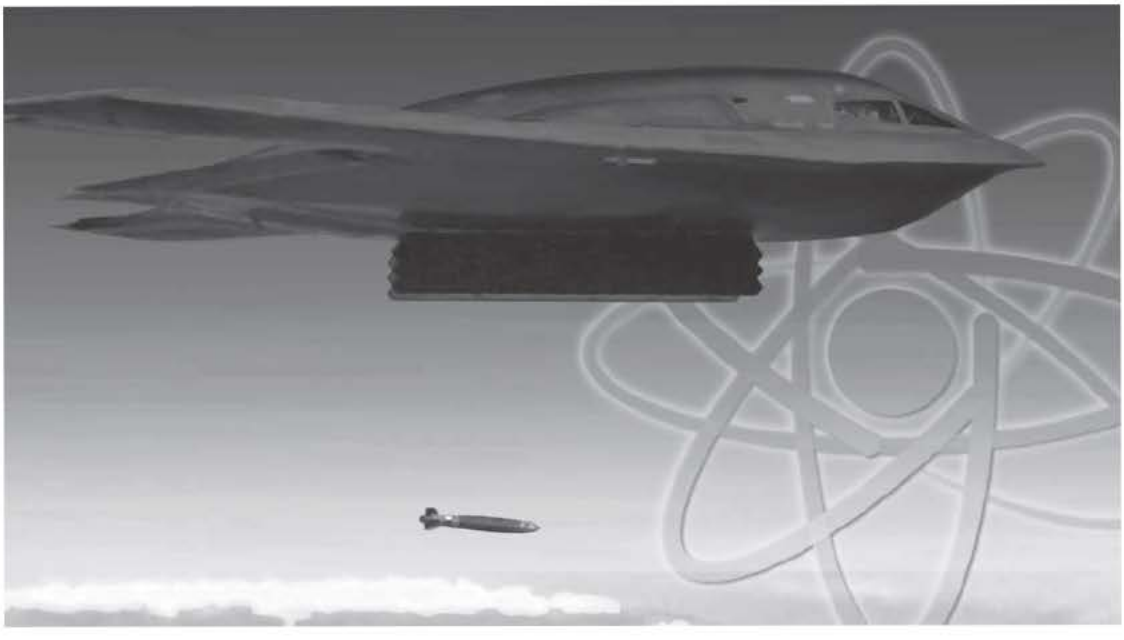


**http://www.airpower.au.af.mil**

# Nonstrategic Nuclear Weapons

## The Neglected Stepchild of Nuclear Arms Control

Dr. George W. Ullrich
Dr. James Scouras
Dr. Michael J. Frankel



The Cuban missile crisis, which brought the United States and Soviet Union to the brink of nuclear war—as well as a dawning realization, now firmly enshrined, that neither side could gain a strategic advantage from the costly and destabilizing nuclear arms race—spawned a succession of strategic arms control treaties, starting with the 1972 Strategic Arms Limitation Treaty (SALT) and progressing through the current New Strategic Arms Reduction Treaty (New START). These

agreements have reduced strategic nuclear arsenals dramatically, and—precisely because of that success—the United States must think very carefully about the next steps in this progression.

In particular, these treaties have focused on strategic (intercontinental-range) delivery vehicles and their nuclear weapons payloads. The 1988 Intermediate-Range Nuclear Forces (INF) Treaty—a notable exception—bans the entire category of ground-launched ballistic and cruise missiles with ranges from 500 to 5,500 kilometers. However, completely unconstrained are all other types of nonstrategic nuclear weapon systems.

The United States has withdrawn from Europe the great majority of its nonstrategic nuclear weapons, which now number several hundred, while Russia maintains thousands in its current arsenal. Understandable strategic reasons exist for both US and Russian choices, but *the implications of the resulting imbalance are not well understood and are thus potentially dangerous*.

## A Brief History

The United States started deploying nuclear weapons in Europe in 1954 and accelerated deployments after 1956 during a period of increasing tension with the Soviet Union. West Germany had just gained admission to the North Atlantic Treaty Organization (NATO) while the Soviet Union's transparent ploy for membership was soundly rejected. In short order, the Soviet Union formed its own alliance of mutual defense and assistance that included eight central and eastern European states known as the Warsaw Pact. Over the next decade, the national armies of the Warsaw Pact states were consolidated into a formidable fighting force under Soviet leadership. NATO could ill afford to match the Warsaw Pact's conventional forces, banking instead on the numerically superior US nuclear arsenal to deter Soviet aggression in Europe. This asymmetric deterrence strategy was amplified by the gradual deployment of thousands more nuclear weapons to Europe, distributed among eight NATO member states. Concurrent with this dramatic rise in nonstrategic nuclear weapons, by the mid-1960s the Soviet Union had essentially achieved parity in strategic weapons with the United States, resulting in a perilous stalemate maintained by the specter of mutual assured destruction (MAD).

Fearful that a conventional conflict in Europe would inevitably trigger a nuclear Armageddon, NATO adopted a policy of "flexible response" in 1967. The premise behind flexible response was that in an attempt to avoid an all-out nuclear conflict, a limited number of US nonstrategic nuclear weapons would be used in a situation in which NATO forces found themselves in danger of being overrun by superior Warsaw Pact conventional forces. Notwithstanding the dubious presumption of being able to maintain escalation control in such a scenario, flexible response was largely regarded as a stabilizing influence on the uneasy standoff between NATO and Warsaw Pact forces throughout the remainder of the Cold War.

The number of US nonstrategic nuclear weapons deployed in Europe peaked in 1971 at more than 7,000, including aircraft-delivered gravity bombs, artillery rounds, atomic demolition munitions, gun projectiles, and warheads on surface-to-air

missiles and short- as well as medium-range surface-to-surface missiles (Pershing I and IA). Later, in the 1980s, the United States deployed ground-launched cruise missiles (GLCM) and the intermediate-range Pershing II in response to Soviet deployments of the SS-20. Significant unilateral reductions also started in the 1980s, driven in part by physical security concerns but also in response to public opposition to nuclear weapons in many NATO countries. The INF Treaty contributed to further reductions, importantly including the Soviet SS-4, SS-5, and SS-20 together with US Pershing II ballistic missiles and the US GLCM. With the end of the Cold War, the dissolution of the Soviet Union, and the disappearance of the Warsaw Pact, the United States turned its attention to further bilateral strategic arms reductions while continuing its unilateral reductions of nonstrategic nuclear weapons, removing all but the B-61 bombs by 1991. Further reductions in the intervening years have resulted in a present-day arsenal of only several hundred forward-deployed nonstrategic nuclear weapons—a still-tangible sign of the continuing US commitment to European security.

In the post–Cold War period, Russia has come to rely on its nonstrategic nuclear arsenal as the only affordable means to offset superior NATO conventional forces and to protect its extensive borders from potential military incursions—a reversal of the US and Soviet postures during the Cold War. Although both the United States and Russia appear committed to maintaining the strategic balance, Russia also seems intent on modernizing its nonstrategic nuclear arsenal, unconstrained by self-imposed numerical or technological limitations.

Policy makers and experts alike are evidently divided in their reactions to the current situation. Many are not concerned, arguing that US conventional superiority has obviated the need for nonstrategic nuclear weapons, that strategic nuclear forces continue to provide all of the necessary deterrent, and that the likelihood of Russian nuclear aggression is extremely low. Others are much more concerned, pointing to recent Russian bellicosity in Ukraine, Russian doctrinal reliance on nonstrategic nuclear weapons, and the continuation of Russian modernization efforts. We are not convinced by either side's arguments, but we believe that concern is sufficiently warranted and that debate at the national level, supported by in-depth analysis, is imperative.

## The Uncertain Future

Our concerns are amplified by the fact that the current situation is by no means static. How the future of nonstrategic nuclear weapons will evolve and the degree to which it may represent an increased or reduced threat are largely unknown. Nevertheless, at least one development appears predictable: the asymmetry in current stockpile numbers is likely to grow. Faced with the push of Russian insistence on the withdrawal of all forward-deployed US nonstrategic nuclear weapons and the pull of continuing unilateral drawdown, America could find that a "nuclear zero" might well be a realistic prospect for at least this component of its nuclear arsenal.

Russian military doctrine for the use of nuclear weapons has also continued to develop, even disavowing the long-standing Soviet pledge of no first use. Indeed, Russian military planners have argued that limited use of low-yield nuclear weapons

could reasonably be expected to de-escalate a conflict and curtail a conventional war of attrition. If the United States eliminates its remaining nonstrategic nuclear weapons, it must rely on threats of direct escalation to strategic nuclear war if Russia vows to use its nonstrategic nuclear weapons. MAD has been the hallmark of nuclear deterrence throughout most of the Cold War and is still generally considered sufficiently credible for attacks against the United States. However, it is not as easy to credit the notion that the United States might respond to first use of a nonstrategic nuclear weapon on a battlefield with either a civilization-ending barrage or even a single strategic nuclear weapon.

A second future development, potentially also extremely important but the subject of less commentary, concerns innovation in the design of nonstrategic nuclear weapons. Up until about 20 years ago, the United States was in the vanguard of exploring and extending the boundaries of such design. Since then the US nuclear design community has been constrained merely to sustain the aging remnants of the Cold War stockpile during an era that has seen billionfold strides in computing power, quantum leaps in precision navigation and timing, and striking improvements in engineering methods and material fabrication. It should come as no surprise that nuclear capabilities under development in other countries could be approaching—and in the case of Russia, could have surpassed—those of the United States. Most notably, Russia has made no secret of its intent to pursue highly accurate, low-yield nonstrategic nuclear weapons. Public statements by senior Russian officials have hinted at the possibility that these weapons might represent a new generation of high-fusion fraction weapons with lethal effects considerably more discriminate than those of current weapons.

The effects of advanced high-fusion fraction nuclear weapons can be markedly different than those from fission weapons of equivalent yield, with attributes that give them a decided advantage in certain war-fighting scenarios. Of particular significance, high-fusion fraction weapons have enhanced lethal-radiation footprints and reduced blast and shock footprints compared to those of fission weapons of equivalent yield.

The possibility that high-fusion fraction devices could undergo further refinement to attain pure fusion status poses additional dilemmas. Current legal proscriptions may not even cover such hypothetical designs. The United States has been resolute about excluding fusion research from all arms control treaties so as not to hinder research in inertial confinement fusion, most notably at the National Ignition Facility. Thus, the Comprehensive Nuclear-Test-Ban Treaty (CTBT), signed but not ratified by the United States, contains no provisions for limiting any testing involving nuclear energy release from pure fusion reactions. This treaty loophole opens the unintended possibility that treaty parties could legally develop and test pure fusion designs.

In any event, such tests would lack the standard radionuclide signature, effectively evading the only nuclear-unique CTBT monitoring protocol. Thus, pure fusion designs, if achievable, would also be inherently subversive of prospects for negotiating arms control treaties by undermining traditional verification regimes.

A pure fusion device would also pose a complementary detection problem for global surveillance efforts during development and production. The extant global nuclear detection architecture, designed to recognize the radiative signatures of

uranium and plutonium, would prove totally ineffective against pure deuterium-tritium fusion devices. Currently no US investment exists in developing detection systems tuned to deuterium-tritium fusion fuel.

## Conclusion

Nonstrategic weapons have largely been ignored in the drive to control the strategic arms competition, resulting in a significant numerical disparity in current US-Russian arsenals. We are aware that other individuals have expressed concerns about this asymmetry and that this subject is on the US agenda for consideration in a potential successor to the New START Treaty. To provide a proper assessment of these concerns and evaluate candidate policies to address them, we see the need for much more in-depth analysis. We call for a concerted intellectual focus on the full spectrum of issues raised by nonstrategic nuclear weapons—of which the US-Russian imbalance is the primary, but not the only, one—before any further reductions in strategic or nonstrategic nuclear weapons occur. Studying these issues requires appropriately challenging the conventional wisdom about nonstrategic nuclear weapons, much of which was born and honed during the Cold War. Examples of such conventional wisdom include the following:

- *The asymmetry in US and Russian nonstrategic nuclear forces does (or does not) matter.* Without justification supported by analysis, either assertion is vacuous. Most worrisome is the unjustified extrapolation of the argument that since asymmetry does not matter, we can and should unilaterally remove all nonstrategic nuclear weapons from Europe.
- *The strategic nuclear balance trumps the nonstrategic nuclear imbalance.* This statement places extreme confidence in the prediction that Russian leaders will believe that their use of nonstrategic nuclear weapons will inevitably lead to strategic nuclear war and thus be deterred from such use.
- *We have conventional superiority, so nonstrategic nuclear weapons are not important.* We do not have conventional superiority everywhere, at all times, and in all circumstances. Further, even if the location, time, and circumstances all align in our favor, higher Russian stakes in any conflict on its border could motivate Russia to use nonstrategic nuclear weapons *because* of our conventional superiority.
- *US nonstrategic nuclear weapons in Europe help maintain cohesion within the NATO alliance, discourage other NATO states from acquiring their own nuclear weapons, and represent a critical rung, short of Armageddon, in the escalation ladder.* An alternative plausible perspective is that they are an anachronism from the Cold War without strategic purpose.
- *An important distinction exists between strategic and nonstrategic weapons.* Much was made of this distinction during the Cold War although it was never entirely clear just what the distinction was. It is increasingly apparent that the terminology is artificial and serves more to muddy thinking than clarify it.

We cannot rely forever on what we once thought was true. The world is continuously changing, and our thinking must do so as well. ✪

**Dr. George W. Ullrich**

Dr. Ullrich (BS, MS, PhD, Drexel University) is senior vice president for strategy development at Applied Research Associates and the former chief technology officer at Schafer Corporation. Previously, he was senior vice president at Science Applications International Corporation. A member of the federal Senior Executive Service since 1984, he has held several prestigious positions within the Department of Defense. As deputy director of the Defense Nuclear Agency during the 1990s, he spearheaded transition of the agency to embrace the broader challenges of the post–Cold War era, including treaty verification, counterproliferation of weapons of mass destruction, and cooperative threat reduction. As director for weapons systems in the Office of the Secretary of Defense, he received the Secretary of Defense Distinguished Service Medal for innovative weapon initiatives. He currently serves as a special adviser to the Science and Technology Panel of US Strategic Command's Strategic Advisory Group and previously served as a member of the Air Force Scientific Advisory Board.

**Dr. James Scouras**

Dr. Scouras (BS, University of Rochester; MS, PhD, University of Maryland) is a national security studies fellow at the Johns Hopkins University Applied Physics Laboratory and the former chief scientist of the Defense Threat Reduction Agency's Advanced Systems and Concepts Office. His research is characterized by the application of novel analytic approaches to hard problems of national significance in the domains of international security, nuclear deterrence, arms control, and terrorism. Previously, he was program director for risk analysis at the Homeland Security Institute, held research positions at the Institute for Defense Analyses and the RAND Corporation, and lectured on nuclear policy in the University of Maryland's General Honors Program. Among his publications is the book *A New Nuclear Century: Strategic Stability and Arms Control* (Praeger, 2002), coauthored with Stephen Cimbala.

**Dr. Michael J. Frankel**

Dr. Frankel (BA, Yeshiva College; PhD, New York University), one of the nation's leading experts on the effects of nuclear weapons, is a senior scientist at Penn State University's Applied Research Laboratory, where he focuses on nuclear treaty verification technologies. As executive director of the Commission to Assess the Threat to the United States from Electromagnetic Pulse Attack, he led development of 15-year global nuclear threat technology projections and infrastructure vulnerability assessments. His prior government service roles include associate director for advanced energetics and nuclear weapons in the Office of the Deputy Undersecretary of Defense (Science and Technology); chief scientist of the Defense Nuclear Agency's Nuclear Phenomenology Division; congressional fellow at the US Senate; and research physicist at the Naval Surface Weapons Center. He has delivered invited lectures, chaired national and international technical symposia, testified before Congress, and published numerous articles in the professional scientific literature..

**Let us know what you think! Leave a comment!**



**http://www.airpower.au.af.mil**

# Diplomatic Counterterrorist Deterrence

## Moving beyond Military Means

SSgt Megan J. Munoz, USAF
Dr. Matthew Crosston

Deterrence is an ancient concept, common to nearly all human interactions. At its core, deterrence involves the act of influencing behavior by manipulating an adversary's cost-benefit analysis. Still, following the attacks of 11 September 2001 (9/11), many policy makers and academics were quick to dismiss

the strategic role that deterrence could play in counterterrorism policy. This lack of confidence has been continually echoed by policy makers and scholars alike. Chiefly, former president George W. Bush concluded that the traditional concepts of deterrence were meaningless in dealing with terrorist networks, which had no nation to claim as their own and whose members were willing to die for their cause.[1] As a result, policy makers, military officials, and US allies have focused instead on militaristic, preemptive strategies for counterterrorism operations.[2] The purpose of this research is to examine critically the role of deterrence theory and analyze whether it can be applied to counterterrorism operations as a means of increasing international security and realizing national objectives with minimal military investment.

Alternatively, many people contend that the road to real success in foreign policy entails hard power alone, often in the form of military strength. However, we believe that it is not solely military power that leads to successful deterrence but the calculated and complementary application of each instrument of power.[3] The principal instrument of this complementary power should be diplomacy. Military strength is still necessary, particularly following a large-scale terrorist attack such as 9/11, but to truly deter terrorism, one must take many other actions. The lessons learned by the international community after more than a decade of fighting this threat teach us that simply targeting individual terrorists and their networks is temporarily effective at quelling activities but ultimately leads to greater resolve in terrorist organizations and legitimizes their actions to local populations. We are now witnessing this phenomenon across Iraq and Syria with the Islamic State of Iraq and the Levant (ISIL or DAESH). Establishing counterterrorism deterrence will require much more than simply targeted strikes: it will involve greater emphasis on diplomacy, nation building, and local cultural/political partnerships, which would allow a legitimate vision and alternative to terrorist pathways. Terrorist operations also need to be locally delegitimized rather than strengthening said organizations when the sole emphasis is on foreign military might.

## The War on Terror and Counterterrorist Deterrence: Fighting for Space

Initial responses to deterrence strategies in the war on terror labeled them relics of the Cold War era, considering them "too limiting and too naïve" to be applicable for this type of warfare.[4] Consequently, the White House moved forward with strategies that paid little mind to the potential of deterrence.[5] Opposed were many commentators and researchers, particularly in the field of political science, who considered deterrence policies a viable tool for US policy makers in combatting terrorism. Their commentaries, however, did not carry the day and have since received little attention.[6] Counterterrorist deterrence strategies are often unpopular because of their perceived heavy-handedness and a lack of confidence that the strategy can be used against a nonstate actor. Such deterrence options, however, remain necessary for meaningful peace negotiations, and therefore US agencies require more resolve, perseverance, and commitment.[7] At the same time, deterrence cannot mirror Cold

War strategy because the threat has fundamentally changed. If the United States continues to emphasize only military strength and pass up new opportunities to deter by other means, then such a decision would invite future challenges and adversely affect long-term American security.[8]

Diplomatic counterterrorist deterrence—especially in weak and failing nations currently inundated with terrorists, such as Iraq, Syria, Yemen, Nigeria, and Afghanistan—must remain a priority for policy innovation. Such deterrence is particularly relevant in Afghanistan, which is confronting significant changes to its political future with new leadership, the removal of troops from the country, and the signing of the Bilateral Security Agreement. Although this agreement allows for the continued presence of certain US troops and facilities in-country, bitter lessons from Iraq prove that relying on military power alone ultimately leaves deterrence efforts weakened and with little influence.

The lack of diplomatic counterterrorist deterrence became widely evident following the declared success in Iraq and victory over al-Qaeda. Unfortunately, the rebranding of al-Qaeda and the emergence of ISIL/DAESH have led many analysts to believe that the withdrawal from Iraq was premature and that the lack of diplomatic counterterrorist deterrence in-country precipitated the rise of this new, more dangerous threat. This unexpected emergence resulted in the resumption of operations (i.e., Operation Inherent Resolve) in the region as a means to destroy the threat and deny regional influence. To ensure that a similar unraveling of achievements in Afghanistan does not occur, we must put careful thought into counterterrorist deterrence strategies. These should continue to delegitimize terrorist organizations that threaten to undermine regional and global security, while simultaneously offering to citizens alternative pathways that carry local legitimacy.

One of the major issues with counterterrorist deterrence strategies is the presence of differentiated goals that accompany power changes. The confrontational approach of former president Hamid Karzai and diplomatic quarrels with the West, along with a regional war of rhetoric with Pakistan, proved costly to his previously earned goodwill with America.[9] New president Ashraf Ghani and the international community must work together to revive the efforts of various strategic partnerships and exploit opportunities not only for economic development but also for counterterrorist deterrence.[10] This revival leads to another argument for significant counterterrorist deterrence strategy: the simple, proactive attempt to prevent nonstate actors from perpetrating terrorist events. Traditionally, their motivation was perceived to be so extreme and their level of resolve so high that deterrence seemed futile.[11] Still, if one is to consider terrorist leaders on the whole to be rational players (and many of them often give this impression), then the use of local leaders who employ diplomatic counterterrorist deterrence becomes critical. This scenario would involve strategies that involve disrupting and destabilizing the legitimacy of terrorist organizations' capabilities and confronting their threat of mass-casualty terrorism at the local level in a nonmilitary manner.[12]

Wyn Q. Bowen, professor of nonproliferation and international security and director of the Centre for Science and Security Studies in the Department of War Studies at King's College London, researches nonproliferation, terrorism, and US security policy. He observes that deterrence strategies with the goal of counter-

terrorism would need to involve three identifiable phases: (1) the "pre-event," whose goals are to deter, protect, and prepare; (2) the "trans-event," whose goals are to deter, attribute, and interdict; and (3) the "post-event," involving investigation, prosecution, retaliation, and recovery. Problems with these dimensions of counterterrorist deterrence, however, involve the possible existence of political, economic, social, and cultural dissimilarities between enemies.[13] We see such a situation today in the war against ISIL/DAESH, whose center of intellectual gravity is an idealized narrative of a unified caliphate that is strengthened, not weakened, by Western intrusion and resistance.[14]

Indeed, deterring a terrorist organization like al-Qaeda or ISIL/DAESH is a complex endeavor for a number of reasons, and any policy aimed at eliminating this threat must reflect such complexity. Thus, prior to creating such policies, one must understand the conditions that gave rise to the terrorist group in the first place. Comprehending the cultural, economic, historical, and political conditions of the nation in which a nonstate terrorist actor develops provides a clear sense of the potential appeal, strength, and longevity of the group or organization.[15] This aspect is critical to the implementation of any counterterrorist deterrence policy and helps clarify its value far beyond the sledgehammer strength of military might.

After all, terrorists are highly motivated and willing to risk nearly anything for their goal. The political objectives of these groups must be acknowledged and examined in detail, for they are often broad, idealistic, unclear, and/or ambiguous. These groups and their members are also difficult to locate, operating transnationally with little central control. Additionally, this threat is supported by many different entities, both passive and active, and can even include the support of US allies (e.g., Pakistan's intelligence services and military). This fact complicates the ability to effectively use traditional deterrence strategies like the ones from the Cold War era. Besides state supporters, a number of other elements comprise a terrorist organization, including recruiters, religious leaders, financiers, and other levels of leadership. Ultimately and ideally, all must be deterred.[16]

If deterrence mechanisms in the traditional sense were put into place against such terrorist networks, the United States would have to explore a number of extremely harsh policy options, including regime change, retaliation against supporters of the networks, and expansion of targeted killing operations. That reality is basically untenable. Therefore it is encouraging that there has been some movement towards counterterrorist deterrence strategy as a new priority, laid out in the United States' 2012 defense strategy. This document gave priority to developing US forces capable of deterring and defeating aggression by any potential adversary, anywhere.[17] To do so, the United States must be able to deny an aggressor the prospect of reaching his objective by imposing unacceptable costs on him *before* he acts.

New strategies like this work more effectively at deterring terrorist organizations because they not only affect their support structures within the nation but also hinder strategic interactions at the international level.[18] Regardless of the intended outcome, policies like these continue to come under attack for their supposed heavy-handedness with international values such as civility, idealism, and human rights. Israel is an example of such a nation that has taken an extremely proactive but harsh approach to deter terrorism. It has carried out targeted killings since the be-

ginning of the second intifada in September 2000, using a variety of tactics (e.g., car bombs, snipers, booby traps, and helicopter gunship attacks) to strike individual members of Hamas and Hezbollah. Following 9/11, US policy has largely followed suit in that it targets individual terrorist leaders and operatives through the use of ground operations and drone strikes. The latter have succeeded in decentralizing many key al-Qaeda and Taliban networks at the expense of widespread unrest and discord from citizens both domestically and internationally, particularly after civilian casualties came to light.[19]

Another argument for the superiority of diplomatic counterterrorist deterrence strategy involves how Israel adapted its drone policy—namely, by ensuring that the targeted individuals were aware of the threat they faced. Israel published the names of individuals wanted as targets and disseminated them within the community where they were suspected to be hiding. Thus, Israel not only targeted individuals with precision (showing capability) and demonstrated its resolve to do so repeatedly (gaining credibility) but also showed those individuals its intention and desires (communication).[20] This scheme proved effective in deterring the behavior of some terrorists since they were ostracized from communities because of citizens' fears that they would inadvertently become victims of an Israeli attack. Since terrorism is a global threat that knows no exclusive religion, nationality, or border, counterterrorist deterrence strategies need to extend beyond the boundaries of pure military strikes. Consequently, to deter terrorism, one must assure that collaboration, cooperation, and strict communication take place among the various members of the international community. The ultimate goal of defeating terrorism should involve deterring these attacks before they occur rather than simply having confidence that severe military consequences can be levied after the fact.

Terrorists have crossed international borders, attacked from within, established cells, chosen targets, and executed attacks with ease. This ability has become apparent in the last few months when the world witnessed terrorist activities by Boko Haram in Nigeria, where hundreds of thousands of citizens are at risk; strikes on innocent civilians and businesses in Paris; the kidnapping and execution of Japanese and Jordanian citizens by ISIL/DAESH; an attack against Parliament Hill in Ottawa, Canada, and a comparable strike in Sydney, Australia; "lone wolf" attacks in New York City and Copenhagen; and the continuation of tensions in Egypt, Mali, Afghanistan, and Pakistan. It is incredibly difficult to prevent these attacks when the most explicit strategies are reactive ex post facto military responses rather than preemptive counterterrorist deterrence strategies that seek to enlist local populations and co-opt them positively to the antiterrorist agenda and interests of global peace.

## Grounding the Idea: Differing Schools of Thought

Many differing opinions and schools of thought exist regarding the deterrence of terrorism. A number of individuals believe that such deterrence is simply not possible, concentrating instead on degrading terrorist capability after the fact. They consider deterring terrorism in any form a waste of valuable resources and a fruit-

less effort. Others think it possible to use classical deterrence theory against terrorism, and still others maintain that although it is feasible to deter terrorism, the strategy must be modified significantly to have any chance of success. This article finds itself squarely in the latter camp.

People who claim that deterrence is either ineffective or impossible against terrorists have the idea that counterterrorism campaigns depend on three main beliefs: (1) that terrorists are irrational and therefore unresponsive to the cost-benefit calculation required for deterrence; (2) that because some terrorists are willing to die for their cause, they cannot be deterred by any means, even if rational; and (3) that even if terrorists were afraid of punishment, they cannot be deterred because after they have carried out an attack (most notably with suicide bombers), there is no physical location subject to retaliation.[21] John Klein argues against this belief by noting that counterterrorist deterrence remains a critical element of US national strategy. He believes that combining deterrence with dissuasion will be effective against the likelihood of a terror attack. Klein further states that although a number of terrorist organizations do not necessarily act uniformly or according to the same underlying beliefs, many leaders in even the most aggressive organizations are motivated by an ideology that embraces martyrdom and an apocalyptic vision. Often this ideology is based on religion or the desire to overthrow a government. Thus, he maintains that this aspect is the very key to deterrence and that the leadership of the organization must be deterred.[22] Ultimately, Klein's point is that because the leaders often function strategically and rationally *even while espousing supposedly irrational goals*, they can be deterred.

Another school of thought—cumulative deterrence—is not the deterrence utilized during the Cold War but a hybrid form whose success does not depend on an all-or-nothing approach. Rather, it considers the overall impact of the threat and allows for some failings against terrorist activity. This strategy is utilized through the considered application of threats and military force, along with a range of assorted incentives. It relies on the belief that the war on terrorism will not be decided with a single overwhelming blow and that deterrence efforts will not fail if terrorist activity takes place. Instead, it acknowledges that deterrence requires extreme patience, unshakable resolve, international cooperation, and a creative, harmonized mix of defensive and offensive measures *with an acceptance of occasional "failures."*[23]

Cumulative deterrence is close to our diplomatic counterterrorist deterrence because it works to improve the economic, social, and political aspects of countries where terrorism flourishes. These locations must be altered so that they prevent terrorists from operating unimpeded, instead driving would-be terrorist recruits away from their destructive impulses and towards the creation of productive, prosperous, and secure societies. These deterrence strategies are designed to gradually wear down the enemy from within by undermining his local arena. They involve a multilayered effort that creates the greatest number of obstacles for the terrorists and their infrastructure, support networks, financial flows, and other means of support over the long term. The strategies call for excellent intelligence, broad coalition planning, and a globalized network that would facilitate the exchange of vital information while encouraging transparency with cutting-edge technology and highly trained military forces.[24]

The intensive actions necessary for such innovative deterrence lead to another school of thought that highlights the costs required and questions whether or not it is worth the attempt at all. Cost-benefit analysis conducted on this topic leads some individuals to believe that enhanced expenditures will always be excessive. By 2011 federal expenditures on domestic homeland security had increased by some $360 billion over those in place in 2001. Furthermore, the federal and national intelligence expenses aimed specifically at defeating terrorism have risen by $110 billion while state, local, and private-sector costs increased by $100 billion.[25]

The skepticism about whether or not deterring terrorism is worth the expense was echoed by Glenn Carle, a 23-year veteran of the Central Intelligence Agency and former deputy of national intelligence for transnational threats: "We must not take fright at the specter our leaders have exaggerated. In fact, we must see jihadists for the small, lethal, disjointed and miserable opponents that they are [and that] al-Qaeda has only a handful of individuals capable of planning, organizing and leading a terrorist organization [and that] although they have threatened attacks, its capabilities are far inferior to its desires."[26] This idea of the lack of a credible threat is supported by Marc Sageman, another "former intelligence officer" who "systematically combed through both open and classified data on jihadists and would-be jihadists around the world," concluding that "al-Qaeda central . . . consist[ed] of a cluster [of] less than 150 actual people."[27]

On this same topic, one should note that the events of 9/11 massively heightened the awareness of the public to the threat of terrorism, resulting in extreme vigilance and leading to tip-offs that often either sent terrorists to jail or foiled their attempts. This information from the public has proven to be a key element of prosecutions in many of the terrorism cases in the United States since 9/11. The frequency and severity of terrorist attacks are also extremely low, making the benefits of enhanced counterterrorism expenditures of nearly a trillion dollars supposedly small by many standard cost-benefit analyses.[28] But this only explains why deterrence policy as it was during the Cold War will not be successful in the fight against terror. Cold War deterrence strategies would legitimize terrorist organizations and thus lend themselves to the creation of more terrorists in the long term, subsequently adding to greater reactive cost. Strategies that legitimize the governments of afflicted nations and build societies that no longer allow freedom of movement to terrorist groups offer long-term success that will reduce the cost over time.

## New Ideas, New Rules, New Deterrence

The United States must take a step back in the push towards democracy in terrorist-harboring states in favor of strengthening moderate Muslims in these regions by continuing homeland deterrence strategies and reallocating resources for multinational partnerships that aid in building the legitimacy of local governments. Finally, the effective deterrence of terrorists demands a significant change in the media's portrayal of these groups and their attacks. This deterrence strategy is by no means quick and depends on taking stock in short-, medium-, and long-term trajectories.

To legitimize governments where terror groups operate, one must offer alternatives to terrorism—for instance, the enactment of robust programs that run parallel to schools, hospitals, and mosques run by Islamic extremists. The programs will work in much the same way that after-school programs provide legal alternatives to crime in the United States. Small movements elsewhere around the globe have enjoyed success of this kind, including establishment of the Basque Autonomous Community in the post-Franco Spanish constitution and the Turkish army, which attempted to eliminate extremist recruitment among Turkish Kurds in the mid-1990s by opening health and educational facilities.[29]

Efforts should also be made to facilitate increasingly open economies and political systems while offering career opportunities for people who neither support nor allow extremists to operate in or run their communities. Flooding such communities with legitimate alternatives would ostracize extremist groups and make those who join them the outcasts of society. These programs will require the governmental sector to work alongside elements of civil society to ensure that they provide more benefits and safety to the population. They must also partner with the international community to give these governments proper mentorship and support. Partnering with local governments rather than establishing a stern, unilateral, in-country military presence will expend fewer resources, legitimize the local government, cause less friction among allies, and quiet the spread of extremism that criticizes an intrusive US presence abroad.[30] Furthermore, instead of allocating resources to military goals, those resources can be put towards projects designed to build up civil society, transparent government, and other legitimate alternatives to terrorist recruitment.

These governments should also consider deradicalization/rehabilitation programs for recruited terrorists and offer assistance to their families, allowing them to reenter society. Such programs will need financial support, education, and job training for women and children. The reintroduction of detainees into the community must be accompanied by strict oversight and opportunities for them to succeed. There were similarly successful programs in Europe during the 1980s when Spain pardoned members of the ETA Basque separatist organization and again when the Italian government offered leniency to members of the Red Brigades in exchange for information that led to the apprehension of nonreformed members.[31]

The criminalizing of terrorist acts must also be standardized across international judicial institutions. States will be obligated to do so under international law and to create legitimate judicial institutions, thus slowly but fundamentally addressing worldwide terrorism effectively. Furthermore, it is not enough that the "international community . . . make abstract pronouncements condemning terrorism as an international crime. Instead, [it] must . . . [explicitly develop an] encompassing definition of terrorism and grant the necessary jurisdiction to the International Criminal Court to try those alleged . . . [as terrorists]."[32] This legal aspect of diplomatic counterterrorist deterrence does not lie only with the international community. It is another way to legitimize a local government by having national prosecutors on the international court try terrorists. Creating a hybrid tribunal with states that diligently suppress terrorism creates partnerships that place peer pressure on those nations that openly allow such criminal activities.[33]

One must also concentrate on deterrence efforts at home. Deterring the homegrown threat calls for many different methods but should focus heavily on intelligence-driven policing and law-enforcement measures. A combination of countercapability and countermotivational measures will have to take place to tackle these threats over the long term, utilizing a combination of diplomatic, defensive, and developmental strategies determined by the specific threat confronted.[34] To spot signs of terrorist activity, one must also take deterrence-through-denial measures and continue to educate the local population.

All of these deterrence measures must occur in tandem with a removal of the global media's focus on terrorists, which fuels and/or glorifies their actions. Global media and local governments must work together towards the common interest of deterring terrorism. Terrorists need publicity to gain attention, inspire fear, and secure a favorable community standing for their cause, all of which the media tends to offer unwittingly. Any publicity of their capabilities alerts the world to the existence of a problem that cannot be ignored, leading to the legitimizing of their group and/or the romanticizing of their cause. Terrorists also need this coverage to amplify panic, spread fear, and facilitate economic loss, such as a decline in investment and tourism, causing members of the local population to lose faith in their government and the latter's ability to protect them.[35] Changing this dynamic will prove difficult because of the very nature of journalism. Media outlets, on the one hand, wish to be the first with the story, making it as timely and dramatic as possible while protecting society's right to know even if such knowledge is damaging in the long run. Government, on the other hand, would like media coverage to advance its agenda instead of the terrorists' and include an understanding of policy objectives, hopefully bolstering the image of government agencies. Moreover, the government wishes to deny terrorists a platform for their ideology by not allowing interviews and presenting them as criminals instead of glamorizing their operations or cause with extensive coverage. So far, an understanding and alliance between the global media and government have been tenuous and spotty at best. But diplomatic counterterrorist deterrence will markedly improve if such an alliance can emerge and if there are fewer cries of co-opted media or manipulative government.[36]

Policy recommendations for the media could include limiting information on hostages that could harm those victims; curtailing information on the movement of police or military operations; restricting or not agreeing to show interviews with terrorists or propaganda videos; waiting to release information to ensure that it is factual and does not lead to unfounded speculation or misinformation; and focusing less on the capabilities of terrorist groups, thus minimizing local panic or agitation. The media and the government must work together towards the common interest of not being unwittingly manipulated into promoting the cause of terrorists while simultaneously ensuring that no one's constitutional and civil rights are infringed upon.[37] Maintaining such a balance will be a delicate task—one that demands major effort and, no doubt, some expected backlash. Nevertheless, open and cooperative communication between the government and global media is a critical element in any counterterrorist deterrence strategy used to delegitimize terrorist operations.

## Conclusion

Diplomatic counterterrorist deterrence strategies that rely less on reactive military force and more on preemptive intelligence gathering, the rule of law, cooperation with the media, and promotion of domestic security—alongside the building of civil society alternatives to terrorist organizations—will diminish the widespread appeal of terror organizations. This strategy is far from the all-or-nothing, do-or-die approach to deterrence during the Cold War and is more efficient and oriented towards the long term than today's militaristic, reactionary strategies to terrorist acts. This approach builds on victories achieved over the short, medium, and long term, designed to wear down the resolve of the enemy and to develop fully functional societies with an actively included citizenry. Such a deterrence strategy requires multilayered processes structured to create the greatest number of obstacles to terrorist organizations, making it too formidable a challenge to carry out operations, severely undermining recruiting opportunities, and ultimately destroying terrorists' ability to survive by depriving them of operational and personnel assets. Diplomatic counterterrorist deterrence does not eliminate the need for a strong military capability, but it does go a long way in reclaiming deterrence as a concept and a policy for an area that sorely needs new ideas and innovation. ✪

### Notes

1. Uri Fisher, "Deterrence, Terrorism, and American Values," *Homeland Security Affairs: The Journal of the Naval Postgraduate School Center for Homeland Defense and Security* 3, no. 1 (February 2007), http://www.hsaj.org/?fullarticle=3.1.4.
2. Gary Schaub Jr., "When Is Deterrence Necessary? Gauging Adversary Intent," *Strategic Studies Quarterly* 3, no. 4 (Winter 2009): 49–74, http://www.au.af.mil/au/ssq/2009/Winter/schaub.pdf.
3. Anne E. Sartori, *Deterrence by Diplomacy* (Princeton, NJ: Princeton University Press, 2005), 4.
4. Fisher, "Deterrence, Terrorism, and American Values."
5. Schaub, "When Is Deterrence Necessary?"
6. Fisher, "Deterrence, Terrorism, and American Values."
7. Davood Moradian, "Why the U.S. Can't Abandon Afghanistan: These Five Principles Should Guide the U.S.-Afghan Relationship after 2014," *Foreign Policy*, 10 January 2013, http://foreignpolicy.com/2013/01/10/why-the-u-s-cant-abandon-afghanistan/.
8. Ibid.
9. Tamim Asey, "10 Priorities for Afghanistan's New President," *Diplomat,* 24 September 2014, http://thediplomat.com/2014/09/10-priorities-for-afghanistans-new-president/.
10. Ibid.
11. Wyn Q. Bowen, "Deterrence and Asymmetry: Non-State Actors and Mass Casualty Terrorism," in *Deterrence and the New Global Security Environment*, ed. Ian R. Kenyon and John Simpson (New York: Routledge, 2006), 46–62.
12. Ibid.
13. Ibid.
14. David Deptula, "How to Defeat ISIL: It's All about the Strategy," *Breaking Defense,* 5 September 2014, http://breakingdefense.com/2014/09/how-to-defeat-isil-its-all-about-the-strategy/.
15. Adam B. Lowther, ed., *Deterrence: Rising Powers, Rogue Regimes, and Terrorism in the Twenty-First Century* (New York: Palgrave Macmillan, 2012).
16. Fisher, "Deterrence, Terrorism, and American Values."
17. Department of Defense, *Sustaining U.S. Global Leadership: Priorities for 21st Century Defense* (Washington, DC: Department of Defense, January 2012), 8–9, http://www.defense.gov/news/Defense_Strategic_Guidance.pdf.

18. Alex S. Wilner, "Targeted Killings in Afghanistan: Measuring Coercion and Deterrence in Counterterrorism and Counterinsurgency," *Studies in Conflict & Terrorism* 33, no. 4 (2010): 307–29, doi:10.1080/10576100903582543.

19. Fisher, "Deterrence, Terrorism, and American Values."

20. Wilner, "Targeted Killings in Afghanistan."

21. Robert F. Trager and Dessislava P. Zagorcheva, "Deterring Terrorism: It Can Be Done," *International Security* 30, no. 3 (2005–6): 87–123.

22. John J. Klein, "Deterring and Dissuading Nuclear Terrorism," *Journal of Strategic Security* 5, no. 1 (Spring 2012): 15–30, http://scholarcommons.usf.edu/cgi/viewcontent.gi?article=1132&context=jss.

23. Doron Almog, "Cumulative Deterrence and the War on Terrorism," *Parameters* 34, no. 4 (Winter 2004–5): 4–19, http://www.libertyparkusafd.org/Hale/Special%20Reports%5CUS%20Military%20Strategy%20II%5CCumulative%20Deterrence%20and%20the%20War%20on%20Terrorism.pdf.

24. Ibid.

25. John Mueller and Mark G. Stewart, "Terror, Security, and Money: Balancing the Risks, Benefits, and Costs of Homeland Security" (presentation at the Annual Convention of the Midwest Political Science Association, Chicago, 1 April 2011), http://politicalscience.osu.edu/faculty/jmueller//ID11TSM.PDF.

26. Ibid., 9.

27. Ibid., 11.

28. Ibid.

29. Laura Dugan and Erica Chenoweth, "Moving beyond Deterrence: The Effectiveness of Raising the Expected Utility of Abstaining from Terrorism in Israel," *American Sociological Review* 77, no. 4 (August 2012): 597–624, doi: 10.1177/0003122412450573.

30. Trager and Zagorcheva, "Deterring Terrorism."

31. Dugan and Chenoweth, "Moving beyond Deterrence."

32. Michael Lawless, "Terrorism: An International Crime," *International Journal* 63, no. 1 (Winter 2007): 157.

33. Erin Creegan, "A Permanent Hybrid Court for Terrorism," *American University International Law Review* 26, no. 2 (2011): 237–313, http://digitalcommons.wcl.american.edu/cgi/viewcontent.cgi?article=1701&context=auilr.

34. Vlatko Cvrtila and Anita Perešin, "The Transformation of Terrorism and New Strategies," *Politička Misao: Croatian Political Science Review* 46, no. 5 (2009): 121–39.

35. Raphael F. Perl, "Terrorism, the Media, and the Government: Perspectives, Trends, and Options for Policymakers," Federation of American Scientists, 22 October 1997, http://www.au.af.mil/au/awc/awcgate/state/crs-terror-media.htm.

36. Ibid.

37. Ibid.

**SSgt Megan J. Munoz, USAF**

Sergeant Munoz (BA, American Military University) is currently a graduate student at Bellevue University, Bellevue, Nebraska, where she is earning a master of science degree in international security and intelligence studies. She has served as an intelligence analyst for the US Air Force and section chief of the Expeditionary Intelligence Support program for the 423rd Mobility Training Squadron, Joint Base McGuire-Dix-Lakehurst, New Jersey. Having accumulated more than 1,000 teaching hours, she is also a key instructor at the US Air Force Expeditionary Center, providing instruction and intelligence support for individuals, courses, and customers dealing with combat, mobility, and counterterrorism operations. She previously served as an analyst at the National Air and Space Intelligence Center, Wright-Patterson AFB, Ohio, where she collected, managed, analyzed, authored, and briefed critical intelligence. Furthermore, she issued products that offered predictive analysis for threats faced by US Department of Defense missions taking place in the Pacific, Europe, the Middle East, and Southeast Asian regions. Additionally, Sergeant Munoz has served on multiple deployments to Afghanistan as an intelligence analyst and a regional counterterrorism/political analyst.

**Dr. Matthew Crosston**

Dr. Crosston (BA, Colgate University; MA, University of London; PhD, Brown University) is a professor of political science, holder of the Miller Chair for Industrial and International Security, and director of the International Security and Intelligence Studies program at Bellevue University, Bellevue, Nebraska. He has authored two well-received books, several book chapters, and over 20 peer-reviewed articles in numerous peer-reviewed journals. His research agenda continues to address counterterrorism, intelligence analysis, failed democratization, and cyber war / ethics. His works have been translated into Russian, Arabic, Chinese, Hebrew, Spanish, and Uzbek. He has worked across the globe promoting interaction between intelligence agencies that share common interests but have trouble overcoming ideological, cultural, and historical obstacles; further, he has tried to foster improved collaboration between the academic and intelligence communities. In 2013 Professor Crosston was named Outstanding Instructor by the International Association for Intelligence Education and received the Commander's Coin for Integrity, Service, and Excellence from the 97th Intelligence Squadron for facilitating foreign language study for Airmen at Offutt AFB, Nebraska. In 2014 he was invited to be a key speaker on "intelligence student best practices" at the Defense Intelligence Agency for the Intelligence Community's Centers for Academic Excellence Senior Advisory Board.

**Let us know what you think! Leave a comment!**



**http://www.airpower.au.af.mil**

# The Iranian Missile Threat to Air Bases

## A Distant Second to China's Conventional Deterrent

Jacob L. Heim

The Department of Defense faces a time of transition as it works to address today's crises while preparing for tomorrow's threats.[1] One of the future concerns for US forces comes from antiaccess/area-denial (A2/AD) capabilities, defined broadly as "the ability to blunt or deny U.S. power projection—across all domains."[2] Within this broad definition, A2 capabilities compromise the ability of US forces to get to the fight whereas AD capabilities inhibit their ability to fight effectively once they arrive.[3] Some capabilities can be employed in both an A2 and an AD role. For instance, submarines could interdict forces as they attempt to deploy into a theater and could then shift to coastal choke points to deny US naval operations inside a theater. Discussions of A2/AD highlight a set of capabilities that could be employed in this manner, including cruise and ballistic missiles, quiet submarines,

sea mines, modern fighter aircraft, space and cyberspace assets, and surface-to-air missiles.[4] Discussions of this threat generally cite multiple countries as potential A2/AD challenges, especially China and Iran.[5]

Grouping Chinese and Iranian capabilities within the same A2/AD rubric can obscure important variation in the possible threat to US forces in different theaters unless accompanying analysis highlights those differences. This article uses an operational analysis of the risk to air bases from conventional theater ballistic missiles (TBM) to illustrate how one critical component of the broader A2/AD threat can vary across theaters.[6] This comparative analysis indicates that the threat to US operating bases in Southwest Asia (SWA) is significantly lower than the one they face in East Asia. The geography of SWA lessens the impact of the already weaker Iranian TBM capabilities. Iran could not significantly hold US air operations at risk outside 500 kilometers (km); therefore, it poses a more modest threat to those operations in the Persian Gulf than do Chinese TBMs in East Asia.[7] The accuracy, payloads, and ranges of the weapons in Iran's ballistic missile arsenal are inadequate to seriously threaten US air operations, in part because US forces could operate from a large number of bases outside the worst threat ring (i.e., more than 500 km from Iran's border).[8] Even within 500 km, the threat posed by Iranian TBMs to air bases could be mitigated in a number of ways. For example, a prudent planner could avoid parking significant numbers of aircraft in the open, distribute parked aircraft across a wide area, and operate fighters from hardened air bases. In short, the Iranian ballistic missile threat to US air bases is exaggerated by the Iranians and likely to remain modest, relative to the threat those bases face in East Asia.[9]

This conclusion is reinforced by a secondary analysis that examines a worst-case future scenario. Even if Iran had China's existing TBM capabilities, the geography of SWA gives the United States basing options that still would entail a significantly lower threat than the one from East Asia. Prudence requires that American defense analysts closely monitor Iran's ballistic missile developments, but the superficial similarities between Iranian and Chinese capabilities should not blind them to the fact that the TBM threats in SWA and East Asia differ dramatically in both scope and quality. As a result of the more favorable geography and the potential adversary's less advanced capabilities, the United States is and should remain capable of conducting air operations in SWA. These differences indicate that substantial regional variation can exist in the nature of A2/AD threats and that overuse of the A2/AD label can obscure as much as enlighten if it is not accompanied by an appropriate analytical effort.

Overlooking regional variations in threats can cause a multitude of problems for American defense planners. First, they may overlook opportunities that exist in SWA. Basing fighters outside effective Iranian TBM attack could be a powerful component of an American war plan, but one would first have to recognize it and then act upon it to create any benefit. By misdiagnosing the Iranian TBM threat, planners could overlook this opportunity. Second, misunderstanding the regional variation of threats can produce misallocation of resources. For example, if the threat to air bases is much severer in East Asia than in SWA, then that situation implies that scarce resources for improving the resilience of air bases should be spent first in East Asia.[10] Finally, such misunderstanding can create an exaggerated sense of decline in American power. If the proliferation of threats such as TBMs is uniformly

eroding the ability of US fighters to operate in the event of war, then this problem would imply a general decline in US power projection. If, however, the TBM threat to air bases is more heterogeneous across regions, then existing American power projection can remain relevant in the lower-threat regions such as SWA. For all of these reasons, it is important to have a clear understanding of the regional variations in the TBM threat to air bases.

The remainder of this article proceeds in five main sections. First, it discusses why defense planners worry about Iran's TBM forces. Second, it examines the capabilities of Iran's and China's TBMs as a means of evaluating their effectiveness at striking key targets on air bases such as runways and parking ramps. Third, the article compares and contrasts Iranian and Chinese ballistic missile doctrine, noting how each country envisions using its TBMs. Fourth, it analyzes how each country's TBM capabilities interact with the bases available to US forces in each region in order to assess the degree to which the TBM threat constrains US basing options in each theater. Finally, the article discusses conclusions drawn from this analysis and implications for US force posture, force structure, and ability to project force globally.

## Iran's Theater Ballistic Missiles and the Risk to US Air Bases

Iran's ballistic missile capabilities represent an ongoing concern for defense planners in the Middle East, Europe, and the United States. In 2009 Secretary of Defense Robert Gates stated that "the threat from Iran's short- and medium-range ballistic missiles . . . is developing more rapidly than previously projected."[11] Concerns over those missiles stem from a variety of factors. Specifically, Iran's nuclear program makes its existing ballistic missiles potential delivery systems for nuclear warheads. If Iran could develop both a nuclear weapon and an intercontinental ballistic missile, then it could hold the US homeland at risk. Even if Iran had no new longer-range missiles, nuclear weapons mated to its existing TBM force could threaten Iran's neighbors. Beyond nuclear threats, its existing conventionally armed TBMs could serve as a coercive tool due to their ability to threaten the population centers of US partners in the Middle East as well as other lucrative targets such as ports and energy infrastructure. Finally, in the event of an open war, these TBMs might threaten military targets, denying Iran's opponents sanctuary from which to prepare and operate their air, land, and naval forces.

Even though the role of Iran's TBMs as a coercive tool has been discussed and although defense analysts frequently mention their war-fighting utility, no operational analysis of the ability of those missiles to accomplish military missions has been conducted.[12] This deficiency is significant because the possibility of Iranian TBMs becoming a potent war-fighting force would have profound consequences on a future conflict in the Persian Gulf. US airpower has enjoyed comparative sanctuary in SWA since 1990, and the 2010 *Quadrennial Defense Review Report* highlighted the potential effects that Iranian TBM developments could have on that sanctuary:

> [Iran is] actively testing and fielding new ballistic missile systems. Many of these systems are more accurate and have greater ranges than the Scud-class missiles used by Iraq in the 1991 Gulf War. As the inventories and capabilities of such systems continue to grow, U.S. forces deployed forward will

> no longer enjoy the relative sanctuary that they have had in conflicts since the end of the Cold War. Air bases, ports of debarkation, logistics hubs, command centers, and other assets essential to high-tempo military operations could be at risk.[13]

Given the importance of air superiority to the American way of war, any compromise of the US military's ability to operate from regional air bases in the event of a conflict is exceptionally concerning.[14] Forward bases' lack of viability would create a major challenge to American war fighting.[15] Iranian rhetoric makes such a threat explicit.[16]

Despite these concerns, no rigorous tests of the ability of Iran's missile force to impede US air operations in SWA have occurred.[17] This article seeks to fill this gap in the literature by assessing the current capabilities of Iran's missiles and comparing them to those of China, which possesses the most active ballistic missile program in the world. Furthermore, it examines Iranian doctrine for its ideas on ballistic missiles before assessing their effectiveness in attacking air bases in SWA. These steps lead to the conclusion that air bases more than 500 km away from Iran have comparative sanctuary from TBM attack.

## The Capabilities of Iranian and Chinese Ballistic Missiles

### *Iranian Theater Ballistic Missiles*

Iran has the largest ballistic missile force in the Middle East. Overall inventory estimates vary, but sources generally agree that Iran has more than 1,000 ballistic missiles of various types. The capabilities of this inventory, however, are uneven. Most of the Iranian ballistic missile force is derived from Soviet Scud missiles, which, in turn, were derived from the German V-2. These are liquid-fueled missiles, which are less mobile and less responsive than solid-fueled missiles. *Jane's Strategic Weapon Systems* reports that the guidance systems of these missiles have improved, compared to those of the Soviet Scuds, but they remain relatively inaccurate.[18] The majority of Iran's inventory is composed of short-range ballistic missiles (SRBM), including a smaller number of medium-range ballistic missiles (MRBM). Currently, it possesses no intermediate-range or intercontinental ballistic missiles (IRBM and ICBM).[19]

Iran continues to develop Scud technology. Its Shahab 3 variants are scaled-up versions of shorter-range Scud missiles using similar designs, materials, and propellants. These longer-range systems require a separating reentry vehicle, a capability that has applicability on intercontinental range systems as well.[20]

Beyond Scud technology, Iran is reportedly developing three new conventional ballistic missile systems. The first of these, the Fateh-110, is noteworthy because it is the first solid-fueled system fielded by Iran. Solid-fueled systems can be more mobile and, thus, more survivable than liquid systems; moreover, they can be readied to fire more quickly, enhancing their responsiveness. This single-stage missile has a range of 200 km—sufficient to reach targets in Kuwait, Bahrain, northern Qatar, the United Arab Emirates (UAE), and eastern Oman. Additionally, the Fateh-110 evidently has impressive accuracy improvements (a reported 100 meters [m] circular

error probable [CEP]) over the Shahab SRBMs (450–700 m CEP).[21] The second new system, the Ashura or Sejil MRBM, is a two-stage solid-fueled missile reportedly in development. If successfully deployed, this missile would represent a major technological advance beyond the Shahab 3–class MRBMs due to the advantages of solid-fueled systems over liquid-fueled systems, summarized above. Finally, the BM-25 MRBM, a single-stage, liquid-fueled missile, is reportedly based upon technology from a Soviet-era submarine-launched ballistic missile. One of the important differences between the BM-25 and the Shahab series is that the BM-25 evidently uses a more energetic propellant to achieve longer ranges than are possible with Shahab propellants.[22] If successfully deployed, the BM-25 could give Iran a longer-ranged, liquid-fueled missile force capable of reaching targets in Western Europe. (Table 1 summarizes the capabilities of Iran's TBMs.) Because some analysts forecast that the accuracy of Iran's TBMs will improve over time, a later section of this article analyzes the effect of a more accurate TBM force.[23]

**Table 1. Iranian conventional ballistic missiles**

| | *Land Attack Theater Ballistic Missiles* | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | *SRBM* | | | | *MRBM* | | | |
| | *CSS-8* | *Fateh-110* | *Shahab 1* | *Shahab 2* | *Shahab 3* | *Shahab 3 (variants)* | *Ashura (Sejil)* | *BM-25* |
| Range (km) | 150 | 200 | 300 | 500 | 1,300 | 2,000–2,500 | 2,000 | 2,500–4,000 |
| Warhead (kg) | 250 | 500 | 985 | 770 | 800 | 500 | 900 | 1,200 |
| CEP (m) | 100 | 100 | 450–610 | 700 | 1,850–2,500 | 2,500 | Unknown | 1,600 |
| | | | | | | | | |
| 2010 Inventory Estimate | 175 | 500 | 150 | 150 | 12 | 12 | | |
| 2010 Launcher Estimate | 30 | Unknown | 12–18 | | 12 | | In Development | In Development |

*Source*: Missile performance data from National Air and Space Intelligence Center (NASIC), *Ballistic and Cruise Missile Threat* (Wright-Patterson AFB, OH: NASIC Public Affairs Office, 2013); and Duncan Lennox, *Jane's Strategic Weapons Systems* (London: Jane's Information Group, 2012). Inventory estimates based on International Institute for Strategic Studies (IISS), *The Military Balance 2012* (Washington, DC: IISS, 2012); and Department of Defense, "Annual Report on Military Power of Iran" (Washington, DC: Department of Defense, April 2012), https://fas.org/man/eprint/dod-iran.pdf. Significant differences exist among open-source estimates of Iranian TBM inventories. In particular, there are few estimates of Iran's Fateh-110 inventory. To get around this deficiency, the estimate summarized here was derived in the following way: CSS-8 and Shahab 1, 2, and 3 inventories from the IISS's *Military Balance* were totaled and then subtracted from the total inventory of 1,000 TBMs cited in the Department of Defense's "Annual Report on Military Power of Iran." Doing so leads to an inventory of Fateh-110s larger than that seen in some other sources. See, for example, Joshua R. Itzkowitz Shifrinson and Miranda Priebe, "A Crude Threat: The Limits of an Iranian Missile Campaign against Saudi Arabian Oil," *International Security* 36, no. 1 (Summer 2011): 167–201. Given that the Fateh-110 is the most accurate and thus the most capable system currently deployed by Iran, this method represents an upper bound on the capabilities of Iran's inventory.

### *Chinese Theater Ballistic Missiles*

Although Iran has the largest ballistic missile force in the Middle East, China currently has the most active and advanced ballistic missile program in the world. It has fielded more than 1,000 highly accurate conventional SRBMs and is currently expanding its conventional MRBM force. All of these missiles are solid-fueled, road-mobile systems that possess high accuracies (less than 50 m CEPs). China has de-

veloped a wide range of payloads for these missiles, including a variety of submunitions. (Table 2 summarizes the capabilities of China's TBMs and cruise missiles.) China's most numerous type of TBM is its SRBM, but it is expanding its conventional land-attack MRBM forces. China's early DF-21/CSS-5 MRBMs were armed with nuclear warheads and had poor accuracy, but the more recent DF-21C variant has improved guidance and a conventional warhead.[24] Although China has not yet built many of these systems, the Department of Defense estimates that the People's Republic of China could double its MRBM production rate.[25]

**Table 2. Chinese conventional land-attack ballistic and cruise missiles**

| | *Land Attack Theater Ballistic Missiles* | | | | | | | | *Cruise Missiles* | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | *SRBM* | | | | | *MRBM* | | *IRBM* | | | |
| | *CSS-7* | | *CSS-6* | | | *CSS-5* | | | | | |
| | *DF-11* | *DF-11A* | *DF-15* | *DF-15A* | *DF-15B* | *DF-21* | *DF-21C* | *New IRBM* | *DH-10* | *ALCM (delivered by B-6)* | |
| Range (km) | 280–350 | 350–530 | 600 | 600 | 600–800 | 1,750+ | 1,750+ | 4,000 | 1,500–2,000 | 3,300[a] | |
| Warhead (kg) | 800 | 500 | 500 | 600 | 600 | 600 | 500 | unknown | 400 | 400 | |
| CEP (m) | 600 | 20–200 | 300 | 30 | 5 | 700 | 50 | unknown | 5–20 | 5–20 | |
| | | | | | | | | | | | |
| 2010 Inventory Estimate | 700–750 | | 350–400 | | | 85–95[b] | 36[c] | In Development | 200–500 | In inventory | |
| 2010 Launcher Estimate | 108 | | 108 | | | 80 | 36 | | 54 | 30 | |

[a]Reflects combined range of H-6 bomber and air-launched cruise missile (ALCM)

[b]85–95 estimate includes all variants of the DF-21

[c]Estimates of DF-21C inventory; subset of total DF-21 inventory

*Source*: Table based upon data from Duncan Lennox, *Jane's Strategic Weapons Systems* (London: Jane's Information Group, 2012); Office of the Secretary of Defense, *Annual Report to Congress: Military and Security Developments Involving the People's Republic of China, 2011* (Washington, DC: Office of the Secretary of Defense, 2011), http://www.defense.gov/pubs/pdfs/2011_CMPR_Final.pdf; Zhang Han and Huang Jingjing, "New Missile 'Ready by 2015': Global Times," *People's Daily Online*, 18 February 2011, http://en.people.cn/90001/90776/90786/7292006.html; Doug Richardson, "China Plans 4,000 km-Range Conventional Ballistic Missile," *Jane's Missiles & Rockets*, 1 March 2011; International Institute for Strategic Studies (IISS), *The Military Balance 2011* (Washington, DC: IISS, 2011); and National Air and Space Intelligence Center (NASIC), *Ballistic and Cruise Missile Threat* (Wright-Patterson AFB, OH: NASIC Public Affairs Office, 2013).

Beyond the DF-21's range (roughly 1,750 km), China does not currently possess a conventionally armed IRBM capable of ranging Guam, but it has announced its intention to develop and deploy such a system by 2015.[26] Thus, within the next decade, it is likely that all permanent US Air Force bases in the Western Pacific will lie within range of conventionally armed, precision TBMs. Meanwhile, China has demonstrated the capacity to expand its force of ground-launched cruise missiles (GLCM) at a rate of more than 100 a year.[27]

### *Operational Capabilities of Iranian and Chinese Theater Ballistic Missiles*

This analysis compares Iranian and Chinese TBM capabilities across two dimensions: accuracy and flexibility, with the bulk of the analysis focusing on the differences in accuracy. These characteristics play key roles in determining the ability of ballistic missiles to fulfill a military goal such as hitting the runways or parking ramps of an air base.

**Accuracy**. The first operational consequence of the differing Chinese and Iranian ballistic missile capabilities arises from their relative accuracies. Most Iranian systems are so inaccurate that they likely could not hit military targets. To illustrate, we begin by considering how many missiles would need to be fired to hit a notional target of 100 m in diameter (e.g., a sizable building on an air base, such as a very large hangar). As figure 1 illustrates, between one and three of the most modern Chinese TBMs would be sufficient to have a greater than 80 percent chance of striking a target of this size. It would take 10 of the most accurate Iranian TBMs (Fateh-110s) to realize a similar probability of hitting the same target. Moreover, 10 Scud-derived Shahabs wouldn't have even a 10 percent chance of success.[28]

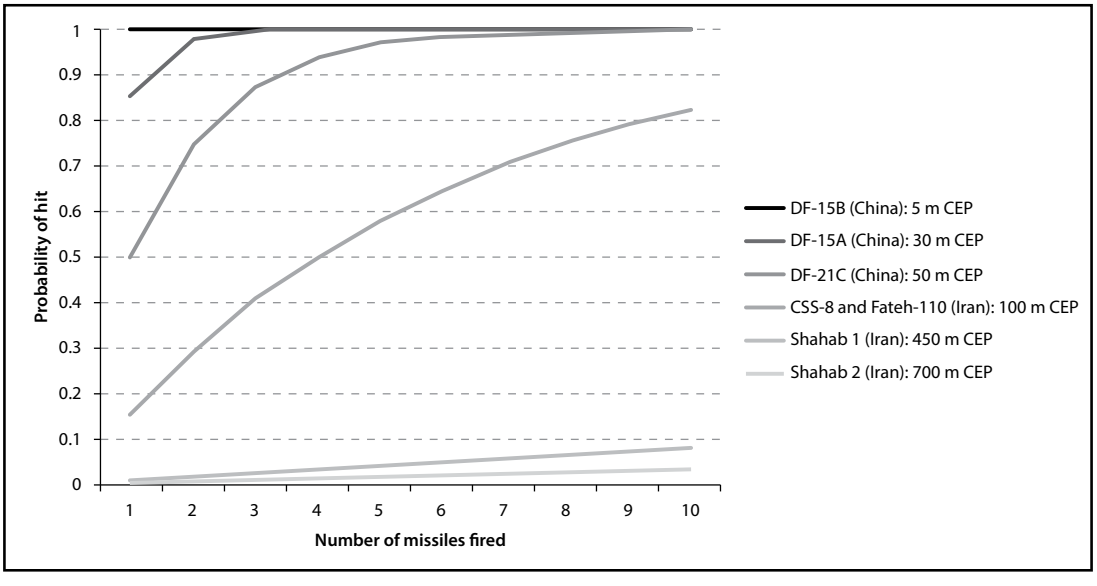



**Figure 1. Cumulative probability of Iranian and Chinese ballistic missiles hitting a target of 100 m in diameter.** (Figure from author's calculations based on accuracies reported in tables 1 and 2.)

As mentioned earlier, one way to compensate for an inaccurate delivery system is to employ submunitions—particularly useful for attacking area targets on air bases, such as runways.[29] Here, the objective is to damage the runways sufficiently to deny a minimum operating surface (MOS)—the least amount of space an aircraft requires to become airborne. For a fighter, a nominal MOS is 5,000 feet long and 50 feet wide.[30] Not knowing the types of antirunway submunition payloads (if any)

with which the Iranians have armed their TBMs, this analysis uses a representative antirunway payload derived from munitions that the United States developed decades ago. This assessment assumes that each missile is armed with 82 10-pound runway-penetrating submunitions dispersed across a circle with a 300-feet radius around the missile impact point.[31] This scenario produces a pattern of submunition impacts sufficiently dense that the probability of leaving a fighter MOS 50 feet wide on a runway 150 feet wide is extremely low (assuming the TBM was aimed at the center point of the runway). Effectively, this means that as long as the missile lands within 225 feet of the center of the runway, its submunition pattern will fully cover the width of the runway and a fighter will be unable to operate over that section until it has been repaired. With this payload, figure 2 depicts the probability of Iranian TBMs doing sufficient damage to a runway to deny a fighter MOS.[32] In the runway-attack case, this mission remains challenging even when inaccurate systems are armed with submunitions. However, it is less demanding than the attack on the target 100 m in diameter with a unitary warhead. Three Fateh-110 systems are adequate to have an 80 percent chance of cutting the runway whereas 10 of those missiles were required to have the same chance of hitting a target 100 m in diameter. The Shahab-class systems, though, still cannot break a 70 percent chance of cutting the runway with a salvo of 10 TBMs.

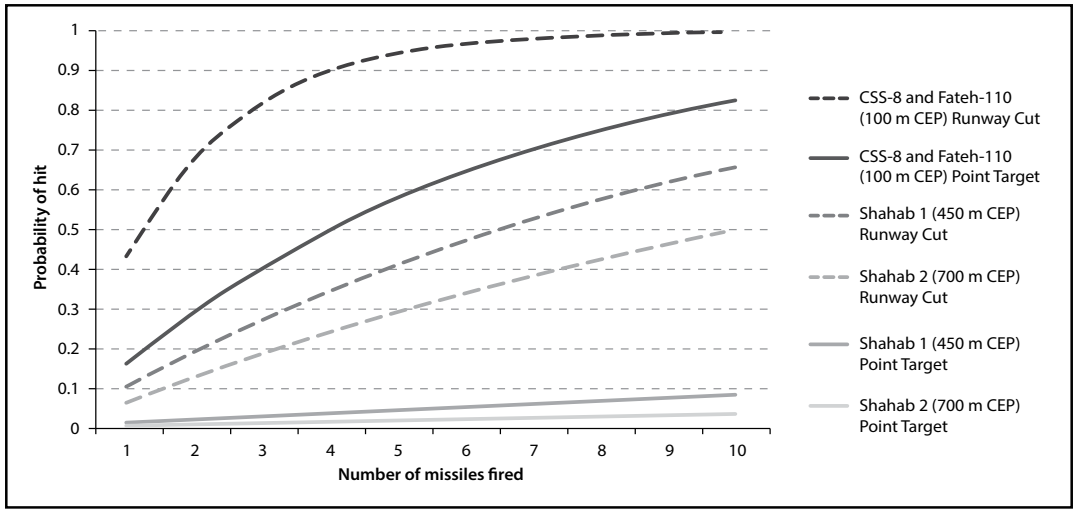



**Figure 2. Cumulative probability of hitting a point target 100 m in diameter or severing a single runway using Iranian ballistic missiles**. (Figure based on author's calculations using accuracies reported in table 1.)

In fact, as table 3 indicates, a salvo of 13 Shahab 1s would be necessary to have a 75 percent chance of making a single runway cut. By way of contrast, the Chinese would have to use only a single reliable conventional TBM to have the same confidence in making such a cut. The story gets even worse for the Iranians because multiple cut points are generally needed to deny all MOSs at an air base. Al Dhafra in the UAE, for example, has two runways, each approximately 12,000 feet long.

Therefore, missiles would have to make two cuts on each runway in order to deny a nominal fighter MOS of 5,000 feet, as illustrated in figure 3. This requirement implies a salvo of 52 Shahab 1s, roughly one-third of the Iranian Shahab 1 inventory.[33] Perhaps if US Air Force aircraft were massed in Al Dhafra, however, it would still be an attractive target. Nevertheless, Iran would have trouble making this attack because it lacks a sufficient number of launchers. The International Institute for Strategic Studies assesses that Iran has only 12–18 launchers for its Shahab 1 and 2 force (i.e., it does not have enough launchers to mount a raid on more than one runway cut point at a time).[34] Because these calculations do not include any active defenses (such as Patriot batteries, operated by both the UAE and US militaries) or missile reliability factors (a fraction of all weapons systems fail—sometimes large fractions), the real challenge is even greater for the Iranians to overcome than these already pessimistic results imply.

**Table 3. Required salvo sizes for runway and parking-area attacks for Iranian and Chinese ballistic missiles**

| *Country* | *Missile Type* | *Salvo Size Required for 0.75 Probability of Cutting a Single Runway* | *Salvo Size Required to Cover 75% of a 770,000 Sq. Ft. Parking Apron* |
|---|---|---|---|
| Iran | CSS-8 | 3 | 1 |
| | Fateh-100 | 3 | 1 |
| | Shahab 1 | 13 | 2 |
| | Shahab 2 | 21 | 4 |
| | Shahab 3 | 71 | 27 |
| | Shahab 3 (variants) | 71 | 27 |
| China | CSS-7 | 1 | 1 |
| | CSS-6 | 1 | 1 |
| | CSS-5 | 1 | 1 |

*Source*: Table from author's calculations based on data reported in tables 1 and 2.

After runways, another major target set on an air base consists of parked aircraft. If not located in hardened shelters, then these aircraft are vulnerable to small submunitions.[35] Armed with one-pound submunitions, a TBM can blanket hundreds of square feet densely enough that every fighter-sized aircraft in the open will likely sustain damage. Arming the Iranian TBM force with this sort of payload produces the salvo sizes in the final column of table 3.[36] Because of the larger footprint of these submunition payloads, feasible salvos can cover 75 percent of a single parking apron of 770,000 square feet. An air base will generally have multiple parking aprons, so all of those would have to be targeted. Still, this analysis indicates that within Shahab 2 range (500 km), Iran could carry out an effective submunition attack on aircraft parked in the open on a single parking apron. Consequently, planners would be wise not to park large numbers of unsheltered aircraft within 500 km of

Iranian launch sites in the event of a major combat operation involving Iran. Fortunately, as discussed in greater detail below, many potential basing options inside 500 km have hardened aircraft shelters; moreover, options exist outside 500 km, which is within range of relevant targets in Iran. Thus, the United States could base its aircraft outside the reach of this threat.

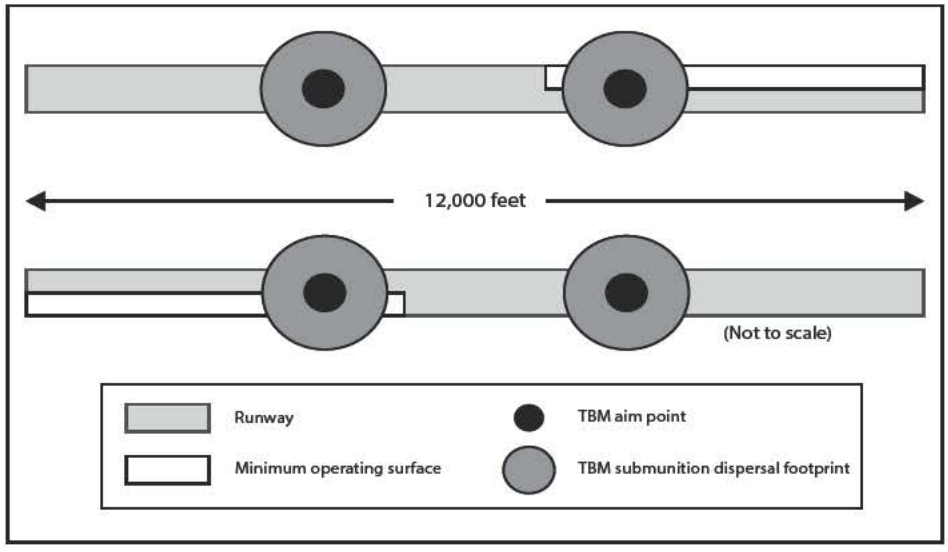



**Figure 3. Illustration of runway cut points**

Since Iran's TBMs seem so poorly suited for striking military targets, what are they good for? Specifically, their accuracy is sufficient to hit large targets like cities. The downtown area of Dubai, for example, is at least 5 km in diameter—greater than or equal to the CEP of all of Iran's missiles. A TBM falling inside this area would create a great deal of fear, regardless of how many people died directly as a result of the TBM strike.[37] Shahab 1 and 2 TBMs would have near certainty of hitting this target (ignoring, as before, missile reliability and missile defenses), and three Shahab 3 missiles would have a cumulative probability in excess of 80 percent of striking a target of this size. Thus, the capabilities of Iran's TBMs align well with a conventional psychological deterrent mission and poorly with a direct military war-fighting mission against adversary air bases.

**Flexibility**. In addition to their greater accuracy, Chinese TBMs are more flexible than Iran's arsenal because China's entire force is solid fueled, possessing satellite navigation capabilities and a high degree of mobility. The following discussion briefly considers each of these three factors in turn.

Solid-fueled systems enjoy multiple advantages over liquid-fueled systems, which must be fueled before they can fire, therefore complicating the launch process and requiring more support vehicles than those needed by solid-fueled missiles. This additional time can give an adversary a greater opportunity to find and attack the missiles before they fire. The fact that liquid-fueled missile batteries must have

propellant vehicles can increase the signature of a unit, making it easier for an adversary to find. Solid-propellant missiles are also safer (highly energetic liquid rocket fuels can be extremely toxic) and easier to maintain in the field, producing a more effective force. Further, solid-fueled missiles can be fired more quickly than liquid systems, helping them strike fleeting targets (assuming adequate accuracy and targeting). Solid systems also accelerate more quickly during their boost phase, making them harder to hit with boost-phase intercept systems and thus more survivable. Clearly, China's all-solid-fueled force is more responsive, flexible, and survivable than Iran's largely liquid-fueled force.

Satellite navigation updates enable a missile to know its position precisely, based upon an external frame of reference. Therefore, missile accuracy is less dependent upon presurveyed sites and precise azimuth alignment before firing, leading to more potential launch sites, harder-to-find sites, faster launches, and more accurate missiles.

All of China's conventionally armed TBMs are fired from transporter erector launchers, but some of Iran's Shahab 3 MRBMs launch from fixed sites and others from mobile erector launchers. An adversary can presurvey fixed sites and attack at the onset of hostilities. Because mobile missiles are harder to find, they are more difficult to attack, but all mobile missiles are not equal. Mobile erector launchers can have less off-road capability than transporter erector launchers, shrinking their potential operating area and possibly making it easier for an adversary to find them.[38]

## A Comparison of Ballistic Missile Doctrine

### *Iranian Ballistic Missile Doctrine*

The threat posed by ballistic missiles depends at least partially upon how a country plans to employ these weapons. Iran's ballistic missile program dates back to the mid-1980s. Spurred by Iraqi attacks on Iranian cities, Iran obtained Scud B SRBMs from Libya and North Korea, ultimately launching approximately 100 TBMs at Iraqi cities over the course of the war.[39] This experience shaped Iranian thinking on the role of ballistic missiles, viewing them as part of a multifaceted deterrence strategy.[40] Iran "seeks to deter aggression against it by using exaggeration, ambiguity, and obfuscation about its ability to exact a prohibitive cost from potential aggressors, especially the United States," with ballistic missiles playing a key role.[41] Although Iran logically would want to hinder the flow of US forces into the region in the event of conflict and disrupt operations once forces arrived in-theater, analysts assess that its leaders believe that ballistic missile strikes "have psychological effects disproportionate to their destructive power."[42] This leads to an emphasis on deterring Gulf Cooperation Council states from providing access to US forces through the threat of cost imposition rather than denial. Overall, Iran's defense doctrine concentrates more on countering invasion and occupation than on projecting power. The TBM force is one of the few power-projection capabilities that Iran does possess, but its current role is to threaten and "mete out punishment" (in conjunction with unconventional attacks) rather than militarily deny air operations from an air base.[43] When Iran has used violence to influence the region, it has relied upon its considerable irregular capabilities such as the

Quds Force (an elite branch of the Iranian Revolutionary Guard Corps that specializes in providing military assistance to nonstate partners), ties to terrorist actors, and regional allies such as Hezbollah in Lebanon. For example, when Iran was displeased about the US military involvement in the Lebanese civil war in the early 1980s, it relied upon its partner Hezbollah to carry out the 1983 Beirut truck bombing of the US Marine Corps barracks instead of staging a conventional military attack. More recently, Iran provided weapons, training, and financing to Shiite militias in Iraq as a means of curtailing US influence in SWA.[44]

Another factor that could hurt Iran's ability to employ TBMs as part of an integrated military strike is its command and control structure. Iran's ballistic missiles are under the control of the Iranian Revolutionary Guard Corps. The fact that the vast majority of Iran's aircraft, however, are operated by the Islamic Republic of Iran Air Force could complicate the planning and execution of a coordinated air and TBM attack.[45]

### *Chinese Ballistic Missile Doctrine*

In contrast to Iran, China's People's Liberation Army (PLA) has developed a doctrine for employing conventional TBMs as part of integrated military campaigns. The Second Artillery Corps was established in 1958, and until the early 1990s it was primarily concerned with nuclear-armed ballistic missiles.[46] With the fall of the Soviet Union and the development of precision-guided weapons, however, the Second Artillery added a conventional role that has expanded dramatically over the past two decades.[47] During this period, the PLA expended a great deal of effort on studying the American way of war and searching for ways to counter it. Chinese military writings identified command, control, communications, computers, intelligence, surveillance, and reconnaissance as well as logistics in general—and forward air bases in particular—as key US vulnerabilities.[48] PLA writers cite conventional ballistic missiles as especially effective for attacking air bases and discuss hitting them with ballistic and cruise missiles in addition to special operations forces and aircraft armed with precision-guided munitions.[49] Much of this writing has addressed Taiwanese air bases, but Second Artillery officers have suggested there "would be opportunities to launch missile strikes against the air force of an 'intervening superpower' in a Taiwan conflict."[50]

These types of attacks likely would come as part of a broader campaign. Two examples of campaigns from PLA doctrine with prominent roles for TBMs are the Joint Anti–Air Raid Campaign and the Joint Firepower Campaign.[51] The former envisions using attacks on adversary air bases as part of a broad effort including fighters, land- and sea-based surface-to-air missiles, and airborne early warning to prevent air strikes on the Chinese mainland.[52] The Joint Firepower Campaign envisions integrating precision strikes from air and missile forces to support anti-air-raid operations or other campaigns.

The Second Artillery serves as a critical enabler for many PLA operations. For example, in a Taiwan scenario, it could use its SRBMs to make a massed and simultaneous strike on all Taiwanese air force bases at the outset of the conflict.[53] The result of such a leading-edge attack could greatly simplify the air superiority mission

of the People's Liberation Army Air Force (PLAAF) by pinning or destroying a large portion of the Taiwanese air force at the outset of the conflict. The US Air Force could face a similar fate were it to posture itself forward during a crisis, inviting preemption by parking large numbers of highly capable aircraft in the open within TBM and cruise missile range from China.[54] Conventional ballistic missiles serve as an enabling force for the PLAAF, filling a role similar to that of US Air Force stealth assets that can penetrate enemy air defenses early in a conflict and strike key points to enable follow-on attacks by more conventional aircraft.

### *Comparing Iranian and Chinese Doctrine*

Realist international-relations theorists focus on capabilities rather than intentions since the latter are inherently uncertain, difficult to discern, and more quickly changeable than capabilities. On the one hand, in theory a cataclysmic event or sudden shift in threat perception could cause intentions to change overnight. On the other hand, developing, testing, and fielding a new military capability can take years. Concentrating on the capabilities of a potential adversary and ignoring intentions constitute a conservative, risk-averse approach that errs on the side of overestimating vulnerability. Given the stakes involved in potential wars, this approach is prudent. For this reason, this article first considered capabilities.

Addressing capabilities exclusively, however, can ignore the importance of organizational culture. How militaries talk and think about using force shapes their actual employment of capabilities. In the case of Iran and China, a stark contrast exists between how they have talked about the utility of conventional TBMs. Iran discusses them as a psychological deterrent with effects in excess of their physically destructive power while China's doctrine views them as a war-fighting capability expected to destroy military targets and thus attain objectives as part of an integrated military campaign. Both forces could be seen as deterrents, but the Iranian approach seeks to deter through cost imposition while the Chinese approach seeks to deter through denial. This difference implies that, without a major discontinuity (examined by the worst-case analysis in the following section), one would expect Iran to continue to develop a threat-in-being while China will continue to develop a war-fighting capability.[55]

## Potential Basing Locations

Although the capabilities and inventories of TBMs can change, geography is largely immutable. The geography of SWA makes it more difficult for Iran to plan a TBM campaign against US air bases in SWA than for China to do so in the Western Pacific. SWA offers a host of possible basing locations. A total of 422 airfields with runways longer than 7,500 feet lie within 2,800 km of Iran.[56] Of these 422 runways, 331 remain outside Shahab 2 SRBM range (i.e., they face no effective military threat). As figure 4 illustrates, SWA offers not only a large number of airfields but also a great diversity in potential partners—in turn increasing the probability that at least one country would provide access to the United States.

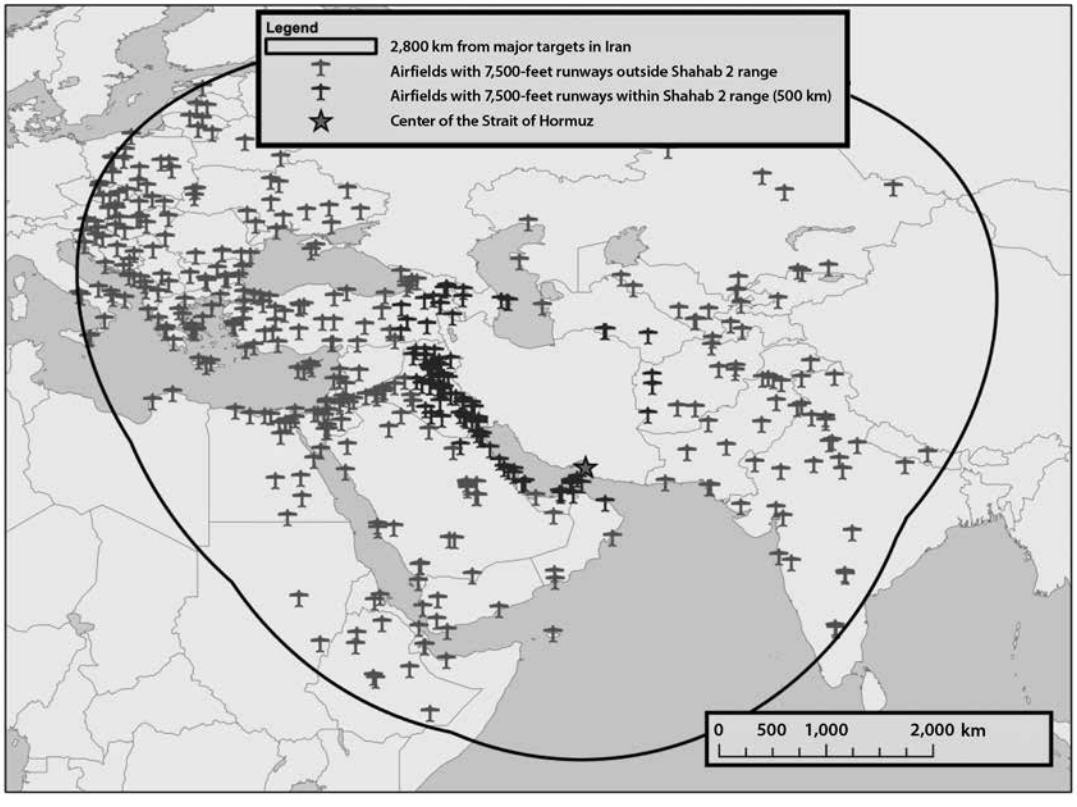



**Figure 4. Airfields with 7,500-feet runways within 1,500 nautical miles of representative Iranian targets**. (TBM ranges from table 1 and airfield locations from the Department of Defense's Automated Air Facility Information File.)

This article has demonstrated the limited capability of Iran's existing missile inventory, but that country could significantly improve its TBM capabilities, either through indigenous development or increased outside assistance. Therefore, it is important to understand how enhanced Iranian TBM capabilities would affect the vulnerability of US air bases and the ranges at which Iran could threaten air operations. To examine this situation, the following discussion first compares the capability of Iran's current TBM arsenal with the total number of runway and parking aim points on air bases within a given range from Iran.[57] Then, given the accuracies and inventories of each class of TBM, it calculates how many salvos could be fired against those aim points. Finally, the examination increases Iran's TBM arsenal to one comparable to that of China today and conducts the same analysis.

The results for Iran's current TBM arsenal are shown in figure 5. The light-shaded bars show the potential number of runway and parking-area aim points in a given range bin while the dark-shaded bars represent the fraction of those aim points that can be attacked.[58] Outside 500 km, Iran's current TBM capabilities do not pose a serious military threat because the Shahab 3 lacks the accuracy and inventory to compose even a single salvo against one runway aim point or parking area. Inside

500 km, Iran's existing capabilities can muster only a small number of salvos. A combination of missile defenses, hardened aircraft shelters, and combat engineering could further degrade the effectiveness of these salvos, enabling the US Air Force to weather them and then operate unimpeded. In short, Iran's current TBM capabilities represent a manageable threat to air bases within 500 km and effectively no threat to those outside that range.

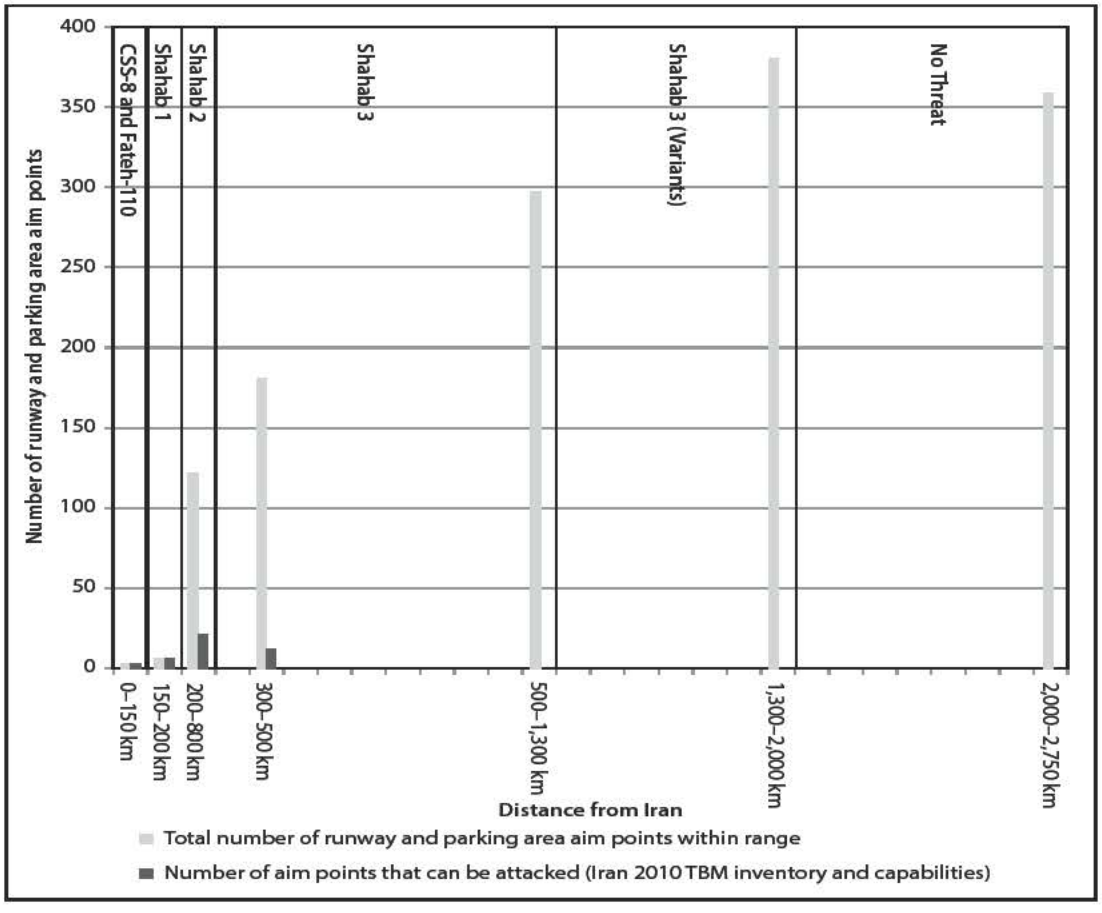



**Figure 5. Iran's ability to attack runways and parked aircraft as a function of range (2010).** (From author's analysis using Iranian TBM capabilities reported in table 1 and airfield locations from the Department of Defense's Automated Air Facility Information File.)

Iran's TBM capabilities could expand in many ways. Given that China has the most capable conventional TBM program in the world, equipping Iran with China's TBM force provides an extreme upper bound on the capabilities that Iran could plausibly possess in the next decade. If Iran had China's entire 2010 conventional TBM inventory, the threat to air bases would certainly grow but would still remain significantly less than the current missile threat in East Asia. As figure 6 shows, in

this excursion, Iran could fire a salvo at every runway and parking aim point within 600 km of its border. Outside that range, however, the number of aim points increases dramatically while Iran's ability to attack them decreases because it has significantly fewer missiles able to range longer than 600 km. In short, inside 600 km, air bases would face a heavy threat, but those beyond that range would face a more limited number of potent salvos. If US Air Force aircraft were concentrated at a small number of bases outside 600 km but within 2,500 km, then Iran could mass multiple salvos against those bases. If, however, US forces could disperse across a number of bases outside 600 km and augment the resilience of these bases with active defenses and combat engineering capabilities, then it might still be possible to weather the limited number of salvos of Iran's expanded TBM arsenal. Although political access is always a contingent decision and difficult to predict, it is noteworthy that 314 airfields with runways of 7,500 feet or longer exist outside the most dangerous 600 km threat zone, representing a wide set of bases to which aircraft could disperse and thus dilute this threat. East Asian geography offers significantly fewer such dispersal air bases. The interaction between geography and TBM capability creates far more potential operating areas in SWA than in East Asia.

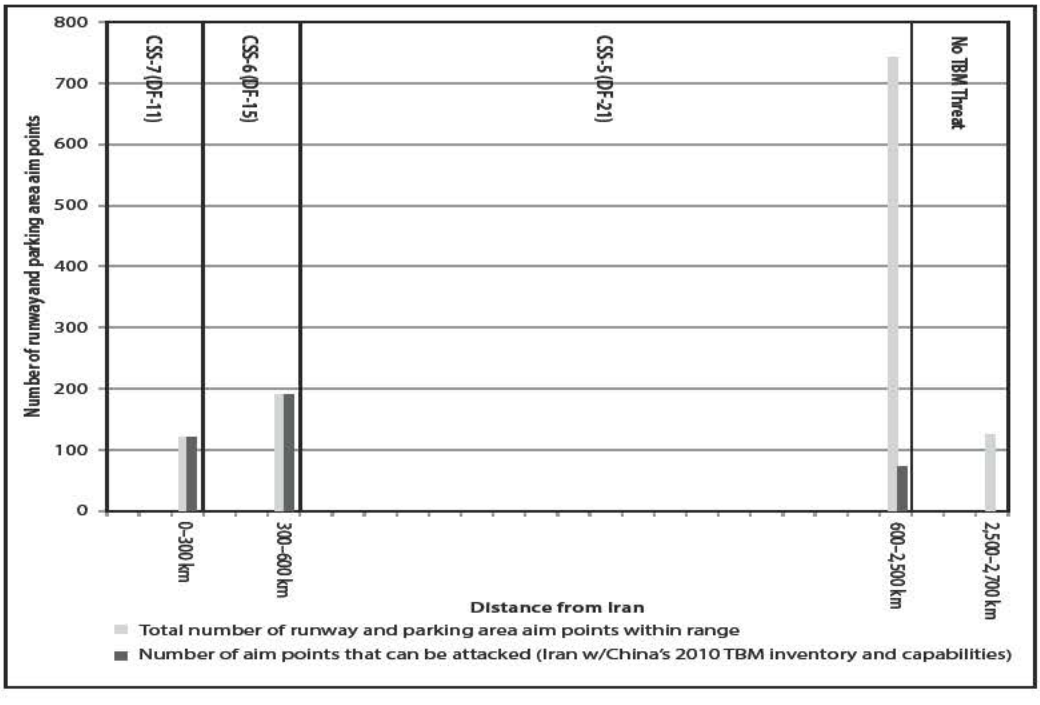



**Figure 6. Iran's ability to attack runways and parked aircraft as a function of range if it had China's 2010 TBM inventory.** (From author's analysis using Chinese TBM capabilities reported in table 2 and airfield locations from the Department of Defense's Automated Air Facility Information File.)

Potential basing options are much more constrained in East Asia, where China's highly capable TBM force can hold airfields at risk out to roughly 2,000 km.[59] As table

3 indicates, one needs only one reliable CSS-5 MRBM to attack a single runway or parking apron aim point with high confidence. That is, China could strike a single large air base (such as Kadena) or multiple small air bases with its estimated 2010 arsenal of 36 CSS-5s. In a Taiwan contingency, US airpower would play an important role.[60] Within 2,800 km of the center of the Taiwan Strait lie 112 airfields that have runways longer than 7,500 feet. As depicted in figure 7, only 4 of these 112 airfields are outside CSS-5 MRBM range.[61]

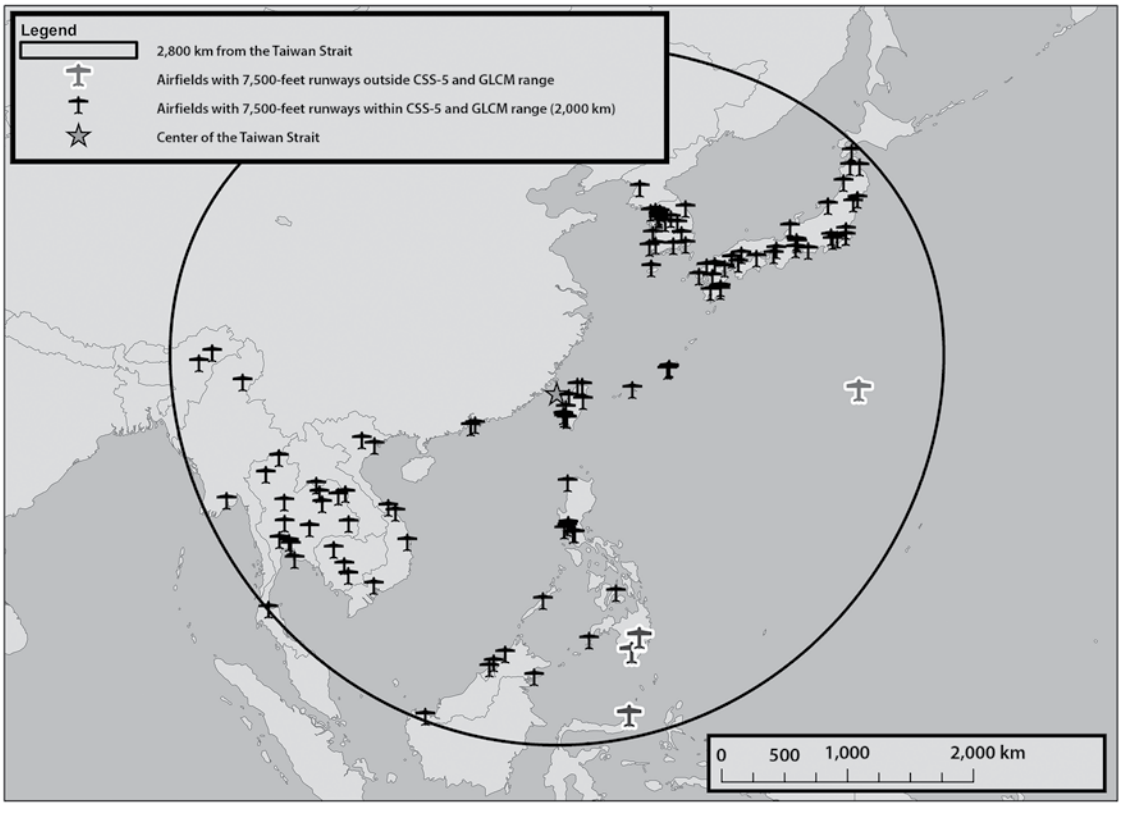



**Figure 7. Airfields with 7,500-feet runways within 1,500 nautical miles of the Taiwan Strait**. (TBM ranges from table 2 and airfield locations from the Department of Defense's Automated Air Facility Information File.)

## Conclusion

A detailed analysis of the capabilities of Iran's existing ballistic missile force clearly indicates the size of the gulf between Iran's threat to US bases in SWA and China's in East Asia. Iranian claims to be able to "obliterate all . . . (US) bases" in SWA are bluster and bluff.[62] It would be prudent to avoid basing unsheltered aircraft within 500 km of Iran in the event of a conflict, but numerous US bases exist outside

the 500 km range, beyond which Iran cannot mount an effective attack to shut down air operations. Consequently, military planners still have numerous options for basing fighters outside the effective TBM threat ring in SWA—an option that they do not have in East Asia. This fact also has implications for US force structure because the basing options in SWA mean that legacy short-range fighters can still contribute a great deal of combat power from comparative sanctuary. If every possible scenario were as contested as the one in East Asia in a US-China contingency, then the ability of short-range land-based fighters to contribute becomes more questionable.

Iran has previously made false claims about its military capabilities, but those concerning the ability of its TBMs to destroy regional air bases are particularly important to counter.[63] Pointing out the severe war-fighting limitations of its force undermines some of the coercive benefits that Iran seeks to reap from its investments in TBMs. If American partners believed Iran's bluff, then they could be intimidated into denying US access. Iran can still threaten TBM strikes on major cities as punishment for any country that does so, but it currently lacks a credible capability to deny US air operations. If Iran developed a nuclear warhead and integrated it onto an SRBM or MRBM, then this new capability would hold at risk unsheltered aircraft much further afield and would constitute a more potent punishment threat.[64]

Understanding the limited ability of Iran's TBMs to deny US air operations in SWA provides important context for the Department of Defense's investment decisions. Since the majority of SWA basing options exist outside the Iranian TBM threat ring, scarce funds to harden air bases should be allocated first to the Western Pacific, where China's growing TBM force presents a much greater concern.

Recognizing the limits of Iran's TBM force also illustrates a broader point about the variability of A2/AD threats around the world. Numerous studies and American defense policy documents list a host of countries developing A2/AD capabilities that challenge the ability of US military forces to operate.[65] Although there are serious concerns about the proliferation of precision to both nation-states and terrorists, significant differences remain between the capabilities that each challenger to American power could bring to bear.[66] The proliferation of advanced weaponry has broad consequences—such as increasing the number of scenarios during which the US Navy could expect to confront some form of antiship cruise missiles—but defense analysts should be careful to not overgeneralize. Overly broad definitions of the A2/AD issue can impede diagnosis. For example, without the quantitative analysis presented here, it would be difficult to recognize that the United States has far better prospects for simply operating outside the threat of TBMs in SWA than it does in East Asia.[67] Recognizing the regional variation in A2/AD can also counter an exaggerated sense of American decline. Although the United States confronts impediments to its projection of force in East Asia, this article's analysis illustrates that the prospects for safely basing fighters in SWA are much better than in East Asia.

To clearly understand the broader military challenge posed by Iran, American national security planners must recognize that Iranian claims about its TBM force's current ability to deny US air operations are a bluff. Prudence demands that defense analysts continue to closely monitor Iran's ongoing efforts to modernize its TBM force, but neither the American public nor the Iranian leadership should mistake this attention for intimidation. ✪

## Notes

1. Secretary of Defense Chuck Hagel, "Reagan National Defense Forum Keynote," US Department of Defense, 15 November 2014, http://www.defense.gov/Speeches/Speech.aspx?SpeechID=1903.

2. Department of Defense, *Quadrennial Defense Review Report* (Washington, DC: Department of Defense, February 2010), 9, http://www.defense.gov/QDR/QDR%20as%20of%2029JAN10%201600.pdf. The term *antiaccess* emerged in American defense circles in the early 1990s to describe a manner in which weaker adversaries might seek to blunt the advantage of US forces. See Roger Cliff et al., *Entering the Dragon's Lair: Chinese Antiaccess Strategies and Their Implications for the United States* (Santa Monica, CA: RAND Corporation, 2007), 3–6, http://www.rand.org/content/dam/rand/pubs/monographs/2007/RAND_MG524.pdf. By 2001 the broader category of antiaccess/area-denial (A2/AD) capabilities had gained currency within the Department of Defense. See Department of Defense, *Quadrennial Defense Review Report* (Washington, DC: Department of Defense, 30 September 2001), 30–32, 43–44, http://www.defense.gov/pubs/qdr2001.pdf. The A2/AD concept helped to focus research into potential future challenges for US forces. See, for example, Christopher J. Bowie, *The Anti-access Threat and Theater Air Bases* (Washington, DC: Center for Strategic and Budgetary Assessments, 2002); Andrew Krepinevich, Barry Watts, and Robert Work, *Meeting the Anti-access and Area-Denial Challenge* (Washington, DC: Center for Strategic and Budgetary Assessments, 2003). See also Air-Sea Battle Office, *Air-Sea Battle: Service Collaboration to Address Anti-access and Area Denial Challenges* (Washington, DC: Air-Sea Battle Office, May 2013), 2, http://www.defense.gov/pubs/ASB-Concept Implementation-Summary-May-2013.pdf.

3. Air-Sea Battle Office, *Air-Sea Battle: Service Collaboration*, 2.

4. Department of Defense, *Joint Operational Access Concept*, version 1.0 (Washington, DC: Department of Defense, 17 January 2012), 9–10, http://www.defense.gov/pubs/pdfs/JOAC_Jan%202012_Signed.pdf; Department of Defense, *Quadrennial Defense Review Report* (2010), 31–32; and Air-Sea Battle Office, *Air-Sea Battle: Service Collaboration*, 2.

5. See, for example, Department of Defense, *Quadrennial Defense Review Report* (2010), 31; Andrew F. Krepinevich, *Why AirSea Battle?* (Washington, DC: Center for Strategic and Budgetary Assessments, February 2010); Nathan Freier, "The Emerging Anti-access/Area-Denial Challenge," Center for Strategic and International Studies, 17 May 2012, http://csis.org/publication/emerging-anti-accessarea-denial-challenge; and John A. Tirpak, "Fighting for Access," *Air Force Magazine* 96, no. 7 (July 2013): 22–27. For a rare discussion that cited only Iran and not China, see Adm Jonathan W. Greenert and Gen Norton A. Schwartz, "Air-Sea Battle: Promoting Stability in an Era of Uncertainty," *American Interest*, 20 February 2012, http://www.the-american-interest.com/2012/02/20/air-sea-battle/.

6. A similar comparative methodology could be used to assess the cross-theater variation in other A2/AD threats, including surface-to-air missile capabilities, submarines, and mining capabilities.

7. Of course, this conclusion depends upon the open-source assessments used to evaluate the capabilities of Iranian missiles.

8. This conclusion follows directly from the limited accuracy, payloads, and ranges of Iran's missiles and does not factor in any American active missile defenses such as Terminal High Altitude Area Defense (THAAD) batteries, Patriot batteries, or sea-based SM-3 interceptors. Given that the United States and its partners possess these capabilities, it implies that air operations in the face of Iranian missile attack would be even *more* feasible than the analysis presented here would imply. Regarding US partners bolstering missile defenses, see David E. Sanger and Eric Schmitt, "U.S. Speeding Up Missile Defenses in Persian Gulf," *New York Times*, 30 January 2010, http://www.nytimes.com/2010/01/31/world/middleeast/31missile.html.

9. This analysis does not explore the potential coercive effect that Iran's threatened or actual attacks on Gulf Cooperation Council members or Israeli cities would have on whether regional states decide to grant the United States access to air bases.

10. Some investments that improve air base resilience, such as rapid runway repair kits, could be deployed to different regions. Others, such as permanent hardened aircraft shelters, are tied to specific locations.

11. "DoD News Briefing with Secretary Gates and Gen. Cartwright from the Pentagon," US Department of Defense, 17 September 2009, http://www.defense.gov/transcripts/transcript.aspx?transcriptid=4479.

12. Media coverage of tensions in SWA frequently cite the Iranian ballistic missile threat. See, for example, "Iran Missiles Can Hit All US Bases in Region: Cmdr.," Press TV, 4 July 2012, http://www.presstv.ir/detail/2012/07/04/249305/iran-missiles-can-easily-hit-us-bases/; Oren Dorell, "Experts Say Iran's Missile Arsenal Poses Threat to U.S.," *USA Today*, 25 September 2012, 8; and Anthony Capaccio, "Iran's Ballistic Missiles Improving, Pentagon Finds," Bloomberg, 10 July 2012, http://www.bloomberg.com/news/2012-07-10/iran-improves-ballistics-missiles-to-target-ships.html.

13. Department of Defense, *Quadrennial Defense Review Report* (2010), 31.

14. In its 2012 report to Congress on Iranian military power, the Department of Defense assessed that "Iran has boosted the lethality and effectiveness of existing [ballistic missile] systems" and concluded that "short-range ballistic missiles provide Tehran with an effective mobile capability to strike partner forces in the region." Department of Defense, "Annual Report on Military Power of Iran" (Washington, DC: Department of Defense, April 2012), 1, 4, https://fas.org/man/eprint/dod-iran.pdf.

15. See Alan Vick, "Challenges to the American Way of War" (presentation at Global Warfare Symposium, Los Angeles, CA, 17 November 2011).

16. For example, in July 2012, Iran conducted a military drill that included ballistic missile strikes on a mock air base target. The commander of its Islamic Revolution Guards Corps Aerospace Force detailed contingency plans for Iran to strike US bases in the opening minutes of a conflict, going so far as to claim that Iran could "obliterate" all US bases in SWA. See "Iran Missiles Can Hit"; and Jeremy Binnie, "Iran Demonstrates Accuracy of Ballistic Missiles," *Jane's Defense Weekly*, 4 July 2012.

17. Qualitative discussions of the Iranian TBM threat to air bases generally conclude that although Iranian missiles cannot hit point targets due to their poor accuracies, they do threaten soft targets such as unsheltered aircraft and area targets. See, for example, William D. O'Malley, *Evaluating Possible Airfield Deployment Options: Middle East Contingencies* (Santa Monica, CA: RAND Corporation, 2001), 27–29; Jeffrey White, "What Would War with Iran Look Like?," *American Interest*, July/August 2011, http://www.the-american-interest.com/article-bd.cfm?piece=982; Anthony H. Cordesman and Alexander Wilner, "Iran and the Gulf Military Balance—II: The Missile and Nuclear Dimensions," working draft (Washington, DC: Center for Strategic and International Studies working draft, 16 July 2012); Krepinevich, *Why AirSea Battle?*, 34; and Mark Gunzinger with Chris Dougherty, *Outside-In: Operating from Range to Defeat Iran's Anti-access and Area Denial Threats* (Washington, DC: Center for Strategic and Budgetary Assessments, 2011), 38. There have been few operational tests of the claim that US bases are vulnerable to Iranian TBM attack, the major exception being an International Institute for Strategic Studies (IISS) net assessment which concluded that Iran's TBMs would probably not be capable of shutting down critical military activities at large military targets like airfields and seaports. See IISS, *Iran's Ballistic Missile Capabilities: A Net Assessment* (London: IISS, 10 May 2010), 139. However, even this highly technical analysis did not explicitly calculate how much damage Iran could do to key elements of an air base (such as runways and parking ramps) at varying distances from Iran. Furthermore, quantitative studies have focused on the TBM threat to energy infrastructure. See, for example, Joshua R. Itzkowitz Shifrinson and Miranda Priebe, "A Crude Threat: The Limits of an Iranian Missile Campaign against Saudi Arabian Oil," *International Security* 36, no. 1 (Summer 2011): 167–201. Moreover, some analyses have narrowly examined the threat that generic TBMs could pose to unsheltered aircraft. See John Stillion and David T. Orletsky, *Airbase Vulnerability to Conventional Cruise-Missile and Ballistic-Missile Attacks: Technology, Scenarios, and U.S. Air Force Reponses* (Santa Monica, CA: RAND Corporation, 1999).

18. A common measure of accuracy is circle error probable (CEP). A weapon's CEP describes a radius within which a weapon lands 50 percent of the time. For example, on average, a missile with a CEP of 100 m will land within 100 m of its aim point 50 percent of the time. Iran's Scuds have CEPs in the hundreds of meters. See Jane's Defense International, "Shahab 1 (R-17 (SS-1C 'Scud B') Variant)," *Jane's Strategic Weapons Systems*, 11 December 2013.

19. Standard nomenclature categorizes missiles with a range of less than 1,000 km as SRBMs, 1,000–3,000 km as MRBMs, 3,000–5,500 km as IRBMs, and in excess of 5,500 km as ICBMs.

20. The Shahab design shares essential characteristics with the North Korean No Dong and the Pakistani Ghauri. See Jane's Defense International, "Hatf 5 (Ghauri)," *Jane's Strategic Weapons Systems*, 24 August 2011; and Jane's Defense International, "Shahab 3/4 (Ghadr-1)," *Jane's Strategic Weapons Systems*, 12 February 2012.

21. See note 18 for an explanation of CEP.

22. Scud/Shahab designs use kerosene as a propellant and inhibited red fuming nitric acid (IRFNA) as an oxidizer, but the BM-25 reportedly uses unsymmetrical dimethalhydrazine (UDMH) as a propellant and hydrogen oxide (H2O4) as an oxidizer. Although hydrazine is more energetic than kerosene (a fuel tank full of UDMH can propel a missile further than one full of kerosene), it is extremely toxic and requires extensive safety precautions during fueling. For this reason, it has been used for applications (such as space launch) where launch sites are fixed and timelines can accommodate appropriate safety precautions or in cases in which the missile can be fueled and then stored (e.g., in a sealed launch tube on a submarine). For more on the strengths and weaknesses of various rocket propellants, see John Clark, *Ignition! An Informal History of Liquid Rocket Propellants* (New Brunswick, NJ: Rutgers University Press, 1972). Ballistic missile analysts actively debate whether the BM-25 is an actual missile or some form of deception. See Markus Schiller, *Characterizing the North Korean Nuclear Missile Threat* (Santa Monica, CA: RAND Corporation, 2012).

23. For forecasts of increased accuracy for Iran's TBMs, see Frederic Wehrey et al., *Dangerous but Not Omnipotent: Exploring the Reach and Limitations of Iranian Power in the Middle East* (Santa Monica, CA: RAND Corporation, 2009), 66; Krepinevich, *Why AirSea Battle?*, 35; and Gunzinger and Dougherty, *Outside-In*, 94.

24. Another conventional variant, the DF-21D, has an antiship mission. See Andrew S. Erickson and David D. Yang, "Using the Land to Control the Sea? Chinese Analysts Consider the Antiship Ballistic Missile," *Naval War College Review* 62, no. 4 (Autumn 2009): 53–86.

25. Department of Defense, *Annual Report to Congress: Military and Security Developments Involving the People's Republic of China, 2010* (Washington, DC: Department of Defense, 2010), 44, http://www.defense.gov/pubs/pdfs/2010_CMPR_Final.pdf.

26. China does currently possess the nuclear-armed, liquid fueled DF-3/CSS-2 IRBM. See Jane's Defense International, "DF-3 (CSS-2)," *Jane's Strategic Weapons Systems*, 26 June 2009. Regarding planned IRBMs, see Doug Richardson, "China Plans 4,000 km-Range Conventional Ballistic Missile," *Jane's Missiles & Rockets*, 1 March 2011.

27. Office of the Secretary of Defense, *Annual Report to Congress: Military Power of the People's Republic of China, 2009* (Washington, DC: Office of the Secretary of Defense, 2009), http://www.defense.gov/pubs/pdfs/China_Military_Power_Report_2009.pdf; and Department of Defense, *Annual Report to Congress* (see note 25).

28. These calculations assume perfect missile reliability, no target location error, and equal variance in x and y error. In short, only the missile's inaccuracy would cause it to miss the target. These assumptions are biased in Iran's favor. The single-shot probability of hit (SSPh) is calculated using a standard formula: SSPh = 1- 0.5^(R^2/CEP^2) where R is the radius of the target and CEP is the missile accuracy. Cumulative probability Ph = 1-(1-SSPh)^N where N is the number of missiles fired. See J. S. Przemieniecki, *Mathematical Methods in Defense Analyses* (Reston, VA: American Institute of Aeronautics and Astronautics, 2000), 38.

29. If the Iranians were to adopt a concept of operations (CONOPS) for air base attack similar to that of the PLA, they might focus on first damaging runways to prevent aircraft from taking off and then stage a follow-on attack to destroy the aircraft that have been pinned at the base. For details on Chinese air base attack CONOPS, see Cliff et al., *Entering the Dragon's Lair*, 81.

30. The precise MOS for an aircraft depends upon a host of factors, including its munitions and fuel loads, the weather, and the altitude of the air base. See Air Force Pamphlet 10-219, vol. 4, *Rapid Runway Repair Operations*, 28 May 2008, http://static.e-publishing.af.mil/production/1/af_a4_7/publication/afpam10-219v4/afpam10-219v4.pdf.

31. This is based upon the US Air Force's BLU-67 antirunway bomb, a 4.5 kilogram (kg) penetrating submunition carrying 2.75 kg of high explosives. See Jane's Defense International, "Penetrating and Area Denial Bombs," *Jane's Air-Launched Weapons*, 18 March 2005.

32. This analysis assumes only a single runway at the airfield—one that it is short enough (say, 7,000 feet) that if a single section is damaged in its center (i.e., 3,500 feet from each end of the runway), then there will be no 5,000-feet-long fighter MOS left. In other words, the attacker has only a single aim point. Later we discuss the case involving multiple runway aim points at a base.

33. In fact, the challenge is even greater because the cumulative probability of all four attacks succeeding is 0.75^4 = 0.32. In order for the probability of shutting down all of the MOSs on Al Dhafra to be 75 percent, the salvo fired at each of the four cut points would have to have an individual probability

of success of 0.93. This would require firing a salvo of 25 Shahab 1s at each cut point, for a total raid size of 100 TBMs.

34. To have more than a 75 percent chance of successfully damaging a runway aim point, Iran must fire 13 Shahab 1 SRBMs at once. If it wished to attack two runway aim points simultaneously, then it would have to launch 26 Shahab 1s simultaneously, requiring 26 launchers. Since it has only 12–18 launchers, it could not attack two runway aim points simultaneously.

35. See Stillion and Orletsky, *Airbase Vulnerability*.

36. This assumes that 75 percent of missile payload is given to submunitions, that each submunition weighs 1 pound, and that they are spaced so that every fighter-sized aircraft, on average, will be within 15 feet of 3 submunitions. For a nominal missile payload of 1,760 pounds (800 kg), this means that the TBM will carry 1,320 1-pound submunitions. If we wish to space these submunitions so that every point inside the submunition dispersal pattern is no more than 15 feet away from a submunition, then we can calculate the TBM's submunition dispersal radius with the following formula: Rd = R*((3*(3^0.5)*N)/(2*$pi$))^0.5 where Rd is the TBM's submunition dispersal radius, R is the maximum distance between two submunitions, and N is the number of submunitions. In this case, Rd is about 495 feet—that is, each arriving TBM covers 771,629 square feet with submunitions. Paul Dreyer derived this equation at RAND in 2010.

37. Even firing Iran's entire ballistic missile arsenal at regional cities would probably create less than a few hundred casualties. See IISS, *Iran's Ballistic Missile Capabilities*, 133.

38. Operating procedures and terrain play a large role in the actual difficulty of finding a mobile erector launcher or transporter erector launcher once it is in the field.

39. Anthony Cordesman and Abraham Wagner, *The Lessons of Modern War*, vol. 2, *The Iran-Iraq War* (London: Mansell Publishing, 1990) 499–502.

40. Wehrey et al., *Dangerous but Not Omnipotent*, 65.

41. Ibid., 41.

42. See ibid., 51. Some Gulf Cooperation Council officials have expressed concern over the threat that ballistic missiles pose to their economies and stability. See ibid., 147–48.

43. Ibid., 70.

44. Lionel Beehner and Greg Bruno, "Iran's Involvement in Iraq," Council on Foreign Relations, 3 March 2008, http://www.cfr.org/iran/irans-involvement-iraq/p12521.

45. Fariborz Haghshenass, "Iran's Air Forces: Struggling to Maintain Readiness," policy no. 1066, Washington Institute, 22 December 2005, http://www.washingtoninstitute.org/policy-analysis/view/irans-air-forces-struggling-to-maintain-readiness.

46. Kenneth Allen and Maryanne Kivlehan-Wise, "Implementing PLA Second Artillery Doctrinal Reforms," in *China's Revolution in Doctrinal Affairs: Emerging Trends in the Operational Art of the Chinese People's Liberation Army*, ed. James Mulvenon and David Finkelstein (Alexandria, VA: CNA Corporation, 2005), 159–200.

47. Michael Chase, Andrew Erickson, and Christopher Yeaw, "Chinese Theater and Strategic Missile Force Modernization and Its Implications for the United States," *Journal of Strategic Studies* 32, no. 1 (February 2009): 67–144.

48. Thomas Mahnken, "China's Anti-access Strategy in Historical and Theoretical Perspective," *Journal of Strategic Studies* 34, no. 3 (June 2011): 299–323.

49. Cliff et al., *Entering the Dragon's Lair*, 62–64.

50. Ibid., 64.

51. Cortez A. Cooper, *Testimony: Joint Anti-access Operations; China's 'Systems-of-Systems' Approach* (Santa Monica, CA: RAND Corporation, 2011), http://www.rand.org/content/dam/rand/pubs/testimonies/2011/RAND_CT356.pdf.

52. Michael Chase and Andrew Erickson, "The Conventional Missile Capabilities of China's Second Artillery Force: Cornerstone of Deterrence and Warfighting," *Asian Security* 8, no. 2 (July 2012): 120, 122.

53. David A. Shalapk et al., *A Question of Balance: Political Context and Military Aspects of the China-Taiwan Dispute* (Santa Monica, CA: RAND Corporation, 2009), http://www.rand.org/content/dam/rand/pubs/monographs/2009/RAND_MG888.pdf.

54. Credit for this point goes to my colleague Alan Vick who generously shared his insight on crisis stability in this context.

55. Iranians' public statements that they plan to attack US air bases do not necessarily invalidate this perspective. A plausible Iranian strategy would be to bluff regarding the capabilities of their missiles in the hopes that doing so might deter the United States from resorting to force or might deter regional states from providing access to the United States for fear of becoming a target.

56. The figure 2,800 km represents a nominal outer boundary at which single-seat fighters could conduct operations. Supported by aerial refueling, fighters can operate at significant distances. Daily flight-duty limits for single-seat aircraft are 12 hours, which include preflight time. Assuming two hours of preflight, a block speed of 500 knots, and 4 hours on station leads to a total time of 12 hours at a radius of 1,500 nautical miles or about 2,800 km. The length of an airfield's runway is only one factor in determining its suitability. Many other factors affect the usefulness of an airfield for military operations, including fuel storage, munitions storage, parking area, and runway strength. The United States also possesses expeditionary capabilities that enable it to rapidly expand the infrastructure of an airfield to enable operations from it. To simplify this illustration, however, this article uses runway length as a filter to estimate the number of useful airfields.

57. Calculation of the number of runway aim points is based upon a simple formula: Ap = Rounddown(RW/5,000) where Ap is number of aim points per runway, RW is the length of the runway in feet, and 5,000 is the length of a nominal fighter MOS in feet. Because of the difficulty of getting high-resolution parking-area data for all of these airfields, we assume that each airfield has only two parking-apron aim points. This underestimate is very conservative because many airfields in the region would require more than two submunition-armed TBMs to cover all of their aircraft parking areas.

58. Of course, it is implausible that the US Air Force would be based at all of the air bases within a given range bin, but it is also implausible that Iran would fire only a single salvo at an air base. For example, runways must be reattacked because combat engineers can repair damaged sections of runway to reopen an MOS.

59. Department of Defense, *Annual Report to Congress*, 32 (see note 25).

60. Shlapak et al., *Question of Balance*.

61. All of these bases in East Asia are within range of Chinese air-launched cruise missiles delivered by medium-range H-6 bombers. See Office of the Secretary of Defense, *Annual Report to Congress: Military and Security Developments Involving the People's Republic of China* (Washington, DC: Office of the Secretary of Defense, 2013), 81.

62. "Iran Missiles Can Hit."

63. For example, Iran unveiled a purported stealth fighter in early 2013 that was widely debunked as a fake. See, for example, Jeremy Binnie, "Iran Unveils 'Stealth Fighter'," *Jane's Defense Weekly*, 4 February 2013. It is also important to temper concerns voiced by American defense analysts regarding the potential threat to air bases from Iranian TBMs.

64. If Iran developed a nuclear warhead and integrated it onto an SRBM or MRBM, then this new capability would threaten unsheltered aircraft much further afield, representing a more credible punishment threat. Nuclear-armed ballistic missiles would be less dependent upon precision to destroy their targets, but Iranian leaders would likely have a higher threshold for their use; consequently, threats to use them in minor crises would be less credible.

65. Examples include the 2010 *Quadrennial Defense Review Report*, which cites China, North Korea, Iran, and Hezbollah as A2/AD challenges (pages 31–32); the 2012 Defense Strategic Guidance, which states that China and Iran "will continue to pursue asymmetric means to counter [American] power projection capabilities" (Department of Defense, *Sustaining U.S. Global Leadership: Priorities for 21st Century Defense* [Washington, DC: Department of Defense, January 2012], 4); and a 2012 article coauthored by the chief of naval operations and the Air Force chief of staff that cites China, Iran, and Hezbollah as A2/AD challenges (Greenert and Schwartz, "Air-Sea Battle").

66. Randy Huiss, *Proliferation of Precision Strike: Issues for Congress*, CRS Report R42539 (Washington, DC: Congressional Research Service, 14 May 2102), http://fas.org/sgp/crs/nuke/R42539.pdf; and James Bonomo et al., *Stealing the Sword: Limiting Terrorist Use of Advanced Conventional Weapons* (Santa Monica, CA: RAND Corporation, 2007).

67. For example, a recent study of the Iranian A2/AD issue concluded that in the future, US forces would need to be able to "fight from extended ranges." Gunzinger and Dougherty, *Outside-In*, 94. As this article has shown, however, air bases more than 500 km away from Iran currently enjoy effective

sanctuary from Iranian TBM attack. Therefore, many basing options exist, and although they are further away than some other locations, they remain well within the effective combat radius of US fighters.

**Jacob L. Heim**

Mr. Heim (BA, Amherst College; MA, School of Advanced International Studies, Johns Hopkins University) is an associate policy analyst at the RAND Corporation. He has conducted strategic assessments and defense analyses for a range of sponsors, including Pacific Air Forces, Headquarters US Air Force, and the Office of the Under Secretary of Defense for Policy. His research interests include the military balance in the Western Pacific, US Air Force overseas force posture, war gaming, and the challenge posed by antiaccess/area-denial capabilities. He previously served as a senior operations research analyst with the MITRE Corporation.

# Deterrence in a Multipolar World

## Prompt Attacks, Regional Challenges, and US-Russian Deterrence

Dr. Stephen J. Cimbala

This study considers the problem of nuclear deterrence and crisis stability in a multipolar nuclear world with special attention to policy options for prompt attack for the United States and Russia. Russian experts in national security recognize, as do Americans, that a Cold War framework no longer suffices either to define or explain their nuclear relationship. Neither Moscow nor Washington officially fears a nuclear surprise attack despite the determination of both states to maintain their nuclear arsenals as uniquely capable for purposes of military deterrence and dissuasion, as well as for the political spillovers symbolic of great-power status. Notwithstanding President Barack Obama's call for nuclear abolition in his Prague speech of 2009, neither Russia nor other nuclear weapons states appear ready for drastic reductions in their nuclear forces.[1]

In addition, interest in nuclear weapons appears to be growing in the Middle East, South Asia, and East Asia, along with the increased possibility of a nuclear crisis in those regions. For these and other reasons, the Eurocentric deterrence regime and paradigm that characterized the definition of nuclear threats during the Cold War have been superseded by a twenty-first-century matrix of widely distributed regional threats in which nuclear arsenals are commingled with nationalism and other potentially virulent strains of political destabilization. This shifting international context also affects our understanding of prompt nuclear attack, previously conceptualized in a bipolar context. Now things have changed—and might change even more.

From the preceding perspective, this study revisits the problem of prompt or fast attack with respect to nuclear deterrence and crisis stability.[2] Prompt attack includes both preemptive and preventive attacks although the emphasis here is on preemption. The primary story line about prompt nuclear attack is enlarged by considering whether and how a multipolar nuclear decision system might differ from the bipolar nuclear system of the Cold War. Prior success stories in nuclear nonproliferation may have increased complacency among strategists and policy makers about the nuclear challenges that lie ahead from all political azimuths.

## Prompt Attack

Prompt military attacks are essentially defensive strategies carried out by offensive means. Motivations for prompt attacks can be diverse, and the following list is not exhaustive: (1) the actor's expectation that an enemy attack is inevitable although not necessarily imminent, (2) the actor's expectation that an enemy attack is both inevitable and imminent, (3) the actor's estimate that a "window of opportunity" exists during which a defender may be caught unawares and thereby disarmed or militarily disadvantaged to great effect, (4) the actor's military predilection and operational codes are such that military-strategic surprise commends itself as a strategy au courant for the nation's high command or its political leadership, and (5) the actor's expectation that offensive military technology is superior to defensive technology, especially if employed to great effect during the initial period of war.[3]

Prompt attacks include both preemption and preventive war. Richard Betts notes that the difference between preemptive and preventive attack "has often been confused, even by professional strategists."[4] The distinction made commonly by theorists is that *preemptive* attacks are undertaken within a time-urgent context, such that an opponent's attack has already been set in motion or is imminent. On the other hand, a *preventive* war is an attack launched to forestall the growing power or future capability of an enemy who might plausibly attack if given the opportunity. In short, as a recent RAND study observes, the utility of preemption "is based on the benefits of being the attacker instead of the defender" whereas preventive war "is motivated by the desire to fight sooner rather than later."[5] Furthermore, there are both political and military trade-offs between preemption and preventive attack. As Betts explains, "Politically, it is much easier to rationalize

preemption than preventive action. Militarily, however, preemptive attack forfeits some of the benefit of surprise that can be kept by a preventive strike."[6]

Instead of a hard-and-fast line between preemption and preventive war, we might prefer to think of a sliding scale or continuum. Some kinds of preemption shade over into some kinds of prevention. The George W. Bush administration described Operation Iraqi Freedom as a preemptive war although some theorists would have classified it as a preventive one. The Bush perspective derived from the administration's tendency to see the "enemy" not only as Saddam Hussein and his regime but also as a potential network of rogue states supporting terrorists. Striking at Saddam was thus a preventive regime change in order to obviate a future need for preemptive or retaliatory attacks against state-sponsored terrorists equipped with weapons of mass destruction (WMD). Although Iraq turned out not to have nuclear or other WMDs, future preventive strikes against states with those weapons and thought to support terrorists might be justified by governments as preventive attacks on regimes that also serve as preemption against terrorists supported by those regimes.[7]

With regard to nuclear weapons during and after the Cold War, most theorists and policy makers have regarded preventive war as morally unacceptable and politically provocative. On the other hand, the United States and other nuclear powers have felt it necessary and legitimate to include preemption among their options available for credible deterrence and crisis management.[8] US declaratory policy since the administration of President John F. Kennedy has required the capability to ride out any nuclear first strike and retaliate, inflicting at a minimum "unacceptable" damage against the society of the attacker.[9] In practice, the US arsenal of the present can certainly accomplish more than this minimal objective against any conceivable attacker. Even with respect to post-Soviet Russia, not to say lesser nuclear powers, the United States can strike back with sufficient retaliatory power to destroy numerous military and political targets in addition to economic and social ones. As Desmond Ball has commented,

> American nuclear war plans have always included a wide range of types of targets—military forces, stockpiles, bases, and installations; economic and industrial centers; political and administrative centers; and, after 1950, the Soviet nuclear forces. Despite the frequent and sometimes quite radical changes in avowed U.S. strategic policies and targeting doctrines over the past three decades, these four general target types or categories have remained remarkably resilient in strategic nuclear war plans.[10]

This second-strike capability defines the baseline for US deterrence capability, but it is not the only option of which US forces are capable. Striking immediately after having detected launch of an enemy attack in progress is also an option for the United States, for Russia, and for future nuclear states with sufficient launch detection, threat identification, and response capabilities (especially the necessary command, control, communications, computers, and intelligence). Of course, deciding on preemption can be a mistake if warning and assessment are faulty. Both the United States and Soviet Union carefully studied the problem of a mistaken warning of nuclear attack during the Cold War. Each built redundant warning systems as well as checks and balances into the decision-making process for nuclear release and launch authorization. Each sought to avoid the risk of unsanctioned or accidental launch or of being caught flat-footed by a genuine attack. Large and redundant arsenals

of weapons and delivery systems also helped reassure leaders against strategic nuclear surprise.[11]

The option of nuclear preemption has been characterized as shooting first as a last resort. During the Cuban missile crisis, US leaders worried whether an invasion of Cuba or air strikes against Soviet medium- and intermediate-range missiles located in Cuba would result in Soviet escalation to large-scale conventional or nuclear war. In turn, President Kennedy announced publicly that the United States would regard *any* nuclear attack from Cuba on the United States or *elsewhere in the Western Hemisphere* as tantamount to a Soviet attack on the United States, guaranteeing a full retaliatory response against the Soviet Union.

Kennedy's statement was a message to Moscow not only about US deterrence of any Soviet attack but also about the Soviet Union's responsibility to prevent any unsanctioned or accidental launch of Soviet weapons from Cuban soil. The president's concern was not misplaced. As we now know, Cuban president Fidel Castro assumed the United States had already made a decision to invade Cuba and urged Soviet premier Nikita Khrushchev to take the nuclear initiative. As Khrushchev recounts in his memoirs,

> Castro suggested that in order to prevent our nuclear missiles from being destroyed, we should launch a preemptive strike against the United States. He concluded that an attack was unavoidable and that this attack had to be preempted. In other words, we needed to immediately deliver a nuclear missile strike against the United States. When we read this I, and all the others, looked at each other, and it became clear to us that Fidel totally failed to understand our purpose.[12]

## Nuclear Preemption

### *The Past: Lessons and Illustrations*

The world has never witnessed a two-sided nuclear conflict, but the Cold War was marked by nuclear competition between the Americans and Soviets that taught hard lessons. Among them was the fact that leaders could not avoid an outbreak of nuclear war simply by amassing larger numbers of weapons. The composition of nuclear forces and the performance attributes of various long-range delivery systems (missiles and bombers) figured into operational and political aspects of deterrence. Then, too, military doctrines for the prevention or deterrence of war—and their relationship to assumptions about nuclear war fighting if deterrence failed—played into the likelihood for crisis and arms-race stability between the Americans and the Soviets.[13]

Nuclear weapons technology enforced some limited doctrinal convergence and behavioral similarity with respect to nuclear strategy despite the very different ways in which Soviet and American leaders perceived the world. Soviet leaders foresaw the inevitable triumph of global communism under their leadership, with a moveable deadline shifting along with the military balance or the "correlation of forces" that included military and other variables.[14] US leaders organized their global strategizing around the grand strategy of containment of the Soviet Union within its existing sphere of influence. These antagonistic and competitive worldviews

coexisted within a technology environment that favored offensive nuclear-delivery systems over defensive antimissile or air defense systems.

Paradoxically, the predominance of offensive over defensive technology during the Cold War did not lead to more surprise attacks, as it might have prior to nuclear weapons, but to a protracted military stalemate. The inability of either the Soviet Union or the United States to write a plan for a credible first-strike capability (denying to the defender his second-strike capability) made preemption or preventive war seem unappealing. This perception remained true even during periods of US nuclear monopoly or clear superiority in numbers of weapons and delivery systems. With regard to preemption, the Cuban missile crisis provided a tutorial for leaders about the dangers of a competition in risk taking that could lead to a mistaken decision for nuclear first strike due to fears based on misperception. As the expressive Premier Khrushchev ruminated in his secret letter to President Kennedy on Friday, 26 October,

> If you have not lost your self-control and sensibly conceive what this might lead to, then, Mr. President, you and I ought not now to pull on the ends of the rope in which you have tied the knot of war, because the more the two of us pull, the tighter the knot will be tied. And a moment may come when that knot will be tied so tight that even he who tied it will not have the strength to untie it, and what that would mean is not for me to explain to you, because you yourself understand perfectly of what terrible forces our countries dispose.[15]

Some Soviet military writings during the Cold War argued that the Soviet Union and international socialism would attain military victory even in a global nuclear war. Some of this amounted to posturing for effect in domestic political debates between military hawks and doves. Moreover, some of this hubris about victory in a nuclear war was Marxist-Leninist philosophy about the inevitable defeat of capitalism superseding common sense and science. Nevertheless, the Soviets' actions in force building and command and control (C2) revealed their awareness of the realities of the nuclear age and of the actual military balance or the larger "correlation of forces" between the United States and the Soviet Union.

It was left to Ronald Reagan and Mikhail Gorbachev to make official what nuclear-weapons scientists and knowledgeable military planners had understood for several decades: a nuclear war cannot be won and should never be fought. To some extent, this declaration was gratuitous, given the scientific knowledge available for a long time about the effects of nuclear weapons.[16] Although Reagan endorsed a broad research program for missile defenses (the Strategic Defense Initiative [SDI]), he did so not for the reasons that the Soviets feared. Reagan sought not nuclear superiority over the USSR but a technology to supersede the mutual vulnerability of deterrence. Contemporary technology was inadequate to the task, but the debate over SDI helped convince Gorbachev of the futility of matching or exceeding US defense capabilities.

Although the construct or policy option of a preventive nuclear war became institutionally unthinkable in Washington and Moscow, the possibility of inadvertent nuclear war or escalation to nuclear from conventional war was very real during the Cold War. This legacy has carried forward into the post–Cold War and twenty-first-century world. The term *inadvertent* means something other than *accidental* war, such as the possibility of a test misfire or other technology failure that leads to war. Inadvertent nuclear war is the result of an unforeseen combination of human

and technical factors, pulling both sides in a nuclear crisis over the brink despite their shared interest in avoiding war.

The likelihood of inadvertent nuclear war between two states is based on their political intentions, military capabilities, approaches to crisis management, the personalities of leaders, standard operating procedures for the management of nuclear forces during peacetime and in crisis, and other variables.[17] A decision for nuclear preemption is so irrevocable that leaders will want as much intelligence as possible relative to the plans and actions of their opponent. Unfortunately, credible intelligence regarding the opponent's political thinking and military planning may be hard to come by under the exigent pressures of crisis. Therefore, states may infer the other side's intentions from the disposition of its forces; the behavior of its command, control, communications, and intelligence systems; or guesswork based on past experience.

For example, during Able Archer 83, a North Atlantic Treaty Organization (NATO) command and communications exercise that tested procedures for the release of alliance nuclear weapons in November 1983, an apparent mind-set among some Soviet intelligence officials led them to conclude (temporarily) that the exercise might be the "real thing"—an actual set of preparatory moves for NATO nuclear release and a possible first strike against Soviet forces and installations in Europe.[18] The pessimistic interpretations of Able Archer were not universally shared among Soviet intelligence officers, but some of the alarmism arose from Soviet military doctrine that foresaw the conversion of an exercise simulating an attack into one as a possible path to war.[19]

Another example of the difficulty of reading the other side's intentions during an exigency occurred during the Cuban missile crisis of 1962. A second letter from Khrushchev to Kennedy on 27 October, more demanding in its terms for settlement compared to an earlier letter the previous day, caused some deliberators in the Executive Committee of the National Security Council to wonder whether Khrushchev had been overruled by a hostile faction of the Soviet Presidium. Robert Kennedy noted that "the change in the language and tenor of the letters from Khrushchev indicated confusion within the Soviet Union, but there was confusion among us as well."[20] Fortunately, in both the NATO Able Archer exercise and the Cuban crisis, the most pessimistic assumptions proved incorrect before leaders could act on them.

A post–Cold War example of a scenario for inadvertent nuclear war occurred in January 1995 during the launch of a Norwegian scientific rocket for the purpose of studying the aurora borealis. The initial phase of the rocket's trajectory resembled that of a ballistic missile launched from a nuclear submarine and possibly headed for Russian territory. Russian early warning systems detected the launch and passed the information to military headquarters. Russian president Boris Yeltsin, the defense minister, and the chief of the Russian general staff were connected via their emergency communication network. For the first time, the Russian president opened his secure briefcase or "football" with nuclear codes for launch authorization. The crisis passed when the rocket trajectory eventually veered away from any possible threat to Russia. The operational misinterpretation of the Norwegian rocket launch was made possible by an earlier bureaucratic mistake. Norwegian officials had notified the Russian foreign ministry well in advance of the launch date that

the rocket test was scheduled and had identified its mission. For unknown reasons, the Russian foreign ministry failed to pass that information to the defense ministry or other military headquarters in time to avoid confusion.

The Russian annexation of Crimea in March 2014 and subsequent destabilization of eastern Ukraine were not immediately seen as a nuclear confrontation between Russia and NATO or the United States. Nevertheless, the possibility of an expanded conventional war between Ukrainian and Russian proxy forces took place beneath the umbrella of US and Russian nuclear weapons. This nuclear shadow over the Russian use of unconventional warfare / political warfare in Ukraine and the responses from NATO and the European Union had two somewhat opposite effects. On the one hand, the presence of Russian and NATO nuclear weapons in Europe made any geographical expansion of the conflict beyond the borders of Ukraine—especially into any NATO country—particularly dangerous. On the other hand, each side could exploit the other's awareness—and fear—of that danger to obtain desired political objectives. Thus, the US-NATO and Russian proxy war over Ukraine was not only a contest in combat activeness and military effectiveness in Ukraine but also a competition in risk management and crisis manipulation.[21]

### *The Future: Issues of Concern*

If the possibility existed of a mistaken preemption during and immediately after the Cold War between the experienced nuclear forces and command systems of America and Russia, then it may be a matter of even more concern with regard to states with newer and more opaque forces and command systems. Further, the Americans and Soviets (and then Russians) had a great deal of experience getting to know one another's military operational proclivities and doctrinal idiosyncrasies, including those that might influence the decision for or against war.

Another consideration relative to nuclear stability in the present century is that the Americans and their NATO allies shared with the Soviets and Russians a commonality of culture and historical experience. Future threats to American or Russian security from WMDs may be presented by states or nonstate actors motivated by cultural and social predispositions neither easily understood by those in the West nor subject to favorable manipulation during a crisis.

The spread of nuclear weapons in Asia (including those parts of the Middle East with geostrategic proximity or reach into Asia) presents a complicated mosaic of possibilities in this regard. States with nuclear forces of variable force structure, operational experience, and C2 systems will be thrown into a matrix of complex political, social, and cultural crosscurrents contributory to the possibility of war. In addition to the existing nuclear powers in Asia, others may seek nuclear weapons if they feel threatened by regional rivals or hostile alliances. Containment of nuclear proliferation in Asia is a desirable political objective for all of the obvious reasons. Nevertheless, the present century is unlikely to see the nuclear hesitancy or risk aversion that marked the Cold War, in part because the military and political discipline imposed by the Cold War superpowers no longer exists but also because states in Asia have new aspirations for regional or global respect.[22]

The spread of ballistic missiles and other nuclear-capable delivery systems in Asia—or in the Middle East with reach into Asia—is especially dangerous because plausible adversaries live close together and are already engaged in ongoing disputes about territory or other issues. The Cold War Americans and Soviets required missiles and airborne delivery systems of intercontinental range to strike at one another's strategic centers of gravity. However, short-range ballistic missiles or fighter-bombers suffice for India and Pakistan to launch attacks at one another with potentially "strategic" effects. China shares borders with Russia, North Korea, India, and Pakistan; Russia, with China and North Korea; India, with Pakistan and China; Pakistan, with India and China; and so on.

The short flights of ballistic missiles between the cities or military forces of contiguous states will leave very little time for warning and attack assessment by the defender. Conventionally armed missiles could easily be mistaken for tactical nuclear first use. Fighter-bombers appearing over the horizon could just as easily be carrying nuclear weapons as conventional ordnance. In addition to the challenges posed by shorter flight times and uncertain weapons loads, potential victims of nuclear attack in Asia may also have forces vulnerable to a first strike and C2 systems that increase decision pressures for rapid—and possibly mistaken—retaliation.

This potpourri of possibilities assails conventional wisdom about nuclear deterrence and proliferation on the part of policy makers and academic theorists. For policy makers in the United States and NATO, spreading nuclear and other WMDs in Asia could profoundly shift the geopolitics of mass destruction from a European center of gravity (in the twentieth century) to an Asian and/or a Middle Eastern center of gravity (in the present century).[23] Such an occurrence would profoundly shake up prognostications to the effect that wars of mass destruction are now passé because of the emergence of the "revolution in military affairs" and its encouragement of information-based warfare.[24] Additionally, the argument has emerged that large-scale war between states or coalitions of states, as opposed to varieties of unconventional warfare and failed states, is exceptional and potentially obsolete.[25] The spread of WMDs and ballistic missiles in Asia could overturn these expectations for the obsolescence or marginalization of major interstate warfare.

For theorists, the argument that the spread of nuclear weapons might be fully compatible with international stability, and perhaps even supportive of international security, may be less sustainable than hitherto believed.[26] Theorists optimistic about the ability of the international order to accommodate the proliferation of nuclear weapons and delivery systems in the present century have made several plausible arguments based on international systems and deterrence theory. First, nuclear weapons may make states more risk averse as opposed to risk acceptant with regard to brandishing military power in support of foreign-policy objectives. Second, if states' nuclear forces can survive a second strike, they contribute to reduced fears of surprise attack. Third, the motives of states with respect to the existing international order are crucial. Revisionists will seek to use nuclear weapons to overturn the existing balance of power. States oriented toward the status quo will use nuclear forces to support the existing distribution of power and, therefore, slow and peaceful change, as opposed to sudden and radical power transitions.

These arguments for a less alarmist view of nuclear proliferation take comfort from the history of nuclear policy in the "first nuclear age," roughly corresponding to the Cold War.[27] Pessimists who predicted that some 30 or more states might have nuclear weapons by the end of the century were proved wrong. However, the Cold War is a dubious precedent for controlling the spread of nuclear weapons outside Europe. The military and security agenda of the Cold War was dominated by the United States and the Soviet Union—especially with regard to nuclear weapons. Ideas about mutual deterrence based on second-strike capability and the deterrence "rationality" according to American or allied Western concepts might be inaccurate guides to the avoidance of war elsewhere.[28] Furthermore, powers favoring nuclear containment in general may fall short of disagreement in specific political cases. Patrick M. Morgan has observed "insufficient agreement among states on how serious it [nuclear proliferation] is and on what to do about it."[29]

The case of Israel and its reaction to Iran's apparent interest in developing and deploying nuclear weapons illustrate several of the points made above about the fragility of nuclear deterrence in post–Cold War conditions and, consequently, the possibly meretricious appeal of prompt attacks. Israel regards Iran's possession of nuclear weapons as an existential threat; consequently, the possibility of an Israeli "preventive" conventional military strike against Iran's nuclear infrastructure prior to actual Iranian nuclear weaponization cannot be excluded. The short flight times of attacking Iranian missiles and the extreme vulnerability of Israel's small territory and population to nuclear attacks suggest an Israeli strategy of prompt launch in response to credible warning of any Iranian nuclear strike. On the other hand, a nuclear attack on Israel would be suicidal for Iran as a state actor vulnerable to powerful Israeli and possibly American responses. Therefore, elements within Iran's complex power structure, such as the Revolutionary Guard, might prefer to smuggle nuclear weapons or materials to terrorists in Lebanon or elsewhere, preserving official deniability for Iran. But the larger problem is that, with respect to state-on-state attacks between Tel Aviv and Tehran, strategies of preemption or even prevention are encouraged by the structure of forces, available weapons technologies, high levels of political distrust between the governments of Israel and Iran, and expected costs of going second compared to first in some scenarios.[30]

## Conclusions

This article offers few words of consolation. On the evidence of past behavior, preemptive nuclear attacks are more likely and therefore more in need of deterrence or other means of avoidance than are preventive nuclear strikes. This finding has special pertinence during the present century, in which nuclear decision making is not as "locked down" by strategic nuclear bipolarity as it was during the Cold War. Existing nuclear weapons states will need to work out joint mechanisms for handling possibly destabilizing crises in the Middle East and in South or East Asia that might otherwise boil over due to regional actors with grievances, nukes, and insufficient experience in crisis management. Stability of a regional balance of nuclear terror resides mainly in the policies of states and in the intentions of their leaders.

The numbers of nuclear-armed states in a region do not by themselves determine the probability of nuclear crisis or war.

Another issue with respect to current and future nuclear deterrence is that although nuclear adventurism and fatal attraction to prompt attacks may start in the regions, they may not end there. For example, a crowded nuclear Asia also threatens to expand "regional" rivalries into global confrontations because the Asian nuclear club includes nuclear weapons states with global ambitions. This concern about horizontal escalation from a regional nuclear conflict has led some experts to recommend that the United States adopt an unconditional "no-first-use" policy for its nuclear weapons and urge other nuclear weapons states to do likewise. An agreed multilateral no-first-use policy would allegedly help prevent an outbreak of nuclear war in Asia and contain such a war if it occurred.[31]

On the other hand, a unilateral US declaration of this sort, without support from other nuclear weapons states, could weaken US extended deterrence now provided to nonnuclear allies, possibly compromising the Treaty on the Non-Proliferation of Nuclear Weapons and encouraging formerly US-protected allies to develop their own nuclear weapons arsenals. A compromise position might be a US declaratory policy of "no first use / guaranteed second use" against future violators of the nuclear taboo as proposed by Paul Bracken.[32] Cautious policy makers, however, might prefer to avoid very specific statements about nuclear use, allowing themselves more leeway under duress and keeping opponents guessing in the exigent circumstance of a crisis. ✪

## Notes

1. "Remarks by President Barack Obama, Hradcany Square, Prague, Czech Republic" (Washington, DC: White House, Office of the Press Secretary, 5 April 209), http://www.whitehouse.gov/the_press_office/Remarks-By-President-Barack-Obama-In-Prague-As-Delivered. Reasons for Russia's reluctance to embrace additional nuclear arms limitations are discussed in Polina Sinovets, "Why Russia Undermines the Norm of Nuclear Disarmament," *PONARS Eurasia*, 20 December 2013, http://www.ponarseurasia.org, in *Johnson's Russia List 2014*, no. 1 (1 January 2014), davidjohnson@starpower.net.

2. The term *anticipatory attacks* is used instead of *prompt attacks* in some analyses (see the following discussion and notes).

3. As Charles Glaser has pointed out, disagreement among theorists about the *requirements* of deterrence does not necessarily imply disagreement about the basic *logic* of deterrence. See Charles L. Glaser, "Why Do Strategists Disagree about the Requirements of Strategic Nuclear Deterrence?," in *Nuclear Arguments: Understanding the Strategic Nuclear Arms and Arms Control Debates*, ed. Lynn Eden and Steven E. Miller (Ithaca, NY: Cornell University Press, 1989), 109–71.

4. Richard K. Betts, *Nuclear Blackmail and Nuclear Balance* (Washington, DC: Brookings Institution, 1987), 161.

5. Karl P. Mueller et al., *Striking First: Preemptive and Preventive Attack in U.S. National Security Policy* (Santa Monica, CA: RAND, 2006), 10. For additional expert discussion, see Colin S. Gray, *The Implications of Preemptive and Preventive War Doctrines: A Reconsideration* (Carlisle, PA: Strategic Studies Institute, US Army War College, July 2007).

6. Betts, *Nuclear Blackmail and Nuclear Balance*, 161.

7. Recent trends in terrorism and terrorist practice may include less reliance on state sponsors, new models of organization, and the ability to mount global campaigns in addition to local attacks. See Brian Michael Jenkins, "The New Age of Terrorism," in *Weapons of Mass Destruction and Terrorism*, 2nd ed., ed. James J. F. Forest and Russell D. Howard (New York: McGraw-Hill, 2013), 29–37.

8. For example, during the Eisenhower administration, some pressures existed for a policy in favor of preventive war, but presidentially approved policy guidance ultimately rejected such war as an option. Preemption, on the other hand, was judged constitutionally acceptable and militarily feasible. See David Alan Rosenberg, "The Origins of Overkill: Nuclear Weapons and American Strategy, 1945–1960," in *Strategy and Nuclear Deterrence*, ed. Steven E. Miller (Princeton, NJ: Princeton University Press, 1984), 113–81, especially 143–45.

9. As Lawrence Freedman has noted, Secretary of Defense Robert McNamara's concept of an "assured destruction" capability or a "mutual assured destruction" relationship between nuclear superpowers had precursors in the late 1950s, such as a "stable balance of terror." See Freedman, *The Evolution of Nuclear Strategy*, 3rd ed. (New York: Palgrave Macmillan, 2003), 232–36. See also Alain C. Enthoven and K. Wayne Smith, *How Much Is Enough? Shaping the Defense Program, 1961–1969* (New York: Harper and Row, 1971), 171–84.

10. Desmond Ball, "U.S. Strategic Forces: How Would They Be Used?," in Miller, *Strategy and Nuclear Deterrence*, 217.

11. Bruce G. Blair, *Strategic Command and Control: Redefining the Nuclear Threat* (Washington, DC: Brookings Institution, 1985), especially 14–49. See also Michael S. Gerson, "The Origins of Strategic Stability: The United States and the Threat of Surprise Attack," in *Strategic Stability: Contending Interpretations*, ed. Elbridge A. Colby and Michael S. Gerson (Carlisle, PA: Strategic Studies Institute, US Army War College, February 2013), 1–46.

12. Nikita Sergeevich Khrushchev, *Khrushchev Remembers: The Glasnost Tapes*, ed. and trans. Jerrold L. Schecter with Vyacheslav V. Luchkov (Boston: Little, Brown, 1990), 177.

13. For pertinent cases and analysis, see Betts, *Nuclear Blackmail and Nuclear Balance*, passim.

14. Raymond L. Garthoff, *Deterrence and the Revolution in Soviet Military Doctrine* (Washington, DC: Brookings Institution, 1990).

15. Cited in Graham T. Allison, *Essence of Decision: Explaining the Cuban Missile Crisis* (Boston: Little, Brown, 1971), 212.

16. See, for example, Office of Technology Assessment, *The Effects of Nuclear War* (Washington, DC: US Government Printing Office, May 1979), especially app. D, 139–45.

17. Scenarios for the development of nuclear war under contemporary conditions are analyzed in George H. Quester, *Nuclear First Strike: Consequences of a Broken Taboo* (Baltimore: Johns Hopkins University Press, 2006), 24–52.

18. Douglas Birch, "The USSR and US Came Closer to Nuclear War Than We Thought," *Atlantic*, 28 May 2013, http://www.theatlantic.com, in *Johnson's Russia List 2013*, no. 97 (29 May 2013), davidjohnson@starpower.net. See also Christopher Andrew and Oleg Gordievsky, eds., *Comrade Kryuchkov's Instructions: Top Secret Files on KGB Foreign Operations, 1975–1985* (Stanford, CA: Stanford University Press, 1993), 68–90; and Robert M. Gates, *From the Shadows: The Ultimate Insider's Story of Five Presidents and How They Won the Cold War* (New York: Simon & Schuster, 1996), 262–73.

19. See Raymond L. Garthoff, *The Great Transition: American-Soviet Relations and the End of the Cold War* (Washington, DC: Brookings Institution, 1994), 138–40.

20. Allison, *Essence of Decision*, 224.

21. For an expansion, see the pertinent chapter in my study *The New Nuclear Disorder* (Farnham, Surrey, UK: Ashgate, 2015).

22. See Paul Bracken, *The Second Nuclear Age: Strategy, Danger, and the New Power Politics* (New York: Times Books, 2012), especially 127–211. For an examination of types of scenarios for nuclear first use, see Quester, *Nuclear First Strike*, especially 24–52.

23. On this issue, see Paul Bracken, *Fire in the East: The Rise of Asian Military Power and the Second Nuclear Age* (New York: HarperCollins, 1999), especially 95–124.

24. Insightful analyses pertinent to this topic include Colin S. Gray, *Making Strategic Sense of Cyber Power: Why the Sky Is Not Falling* (Carlisle, PA: Strategic Studies Institute, US Army War College, April 2013); Thomas M. Chen, *An Assessment of the Department of Defense Strategy for Operating in Cyberspace* (Carlisle, PA: Strategic Studies Institute, US Army War College, September 2013); Kamaal T. Jabbour and E. Paul Ratazzi, "Does the United States Need a New Model for Cyber Deterrence?," in *Deterrence: Rising Powers, Rogue Regimes, and Terrorism in the Twenty-First Century*, ed. Adam B. Lowther (New York: Palgrave Macmillan, 2012), 33–45; and Martin C. Libicki, *Cyberdeterrence and Cyberwar* (Santa Monica, CA: RAND, 2009).

25. Important theoretical perspective and policy-relevant commentary on future war (and warfare) appear in Richard Ned Lebow, *Why Nations Fight: Past and Future Motives for War* (Cambridge, UK: Cambridge University Press, 2010), especially chaps. 5 and 6; and in Colin S. Gray, *Another Bloody Century: Future Warfare* (London: Weidenfeld and Nicolson, 2005), passim. See also Martin van Creveld, *The Transformation of War* (New York: Free Press, 1991), especially 1–32 and 192–223.

26. For contrasting perspectives on this issue, see Kenneth N. Waltz, "More May Be Better," in Scott D. Sagan and Kenneth N. Waltz, *The Spread of Nuclear Weapons: A Debate* (New York: W. W. Norton, 1995), 1–45; and Scott D. Sagan, "More Will Be Worse," in Sagan and Waltz, *Spread of Nuclear Weapons*, 47–91.

27. On the concepts of the first and second nuclear ages, see Bracken, *Second Nuclear Age*, passim; Colin S. Gray, *The Second Nuclear Age* (Boulder, CO: Lynne Rienner, 1999); and Keith B. Payne, *Deterrence in the Second Nuclear Age* (Lexington: University Press of Kentucky, 1996).

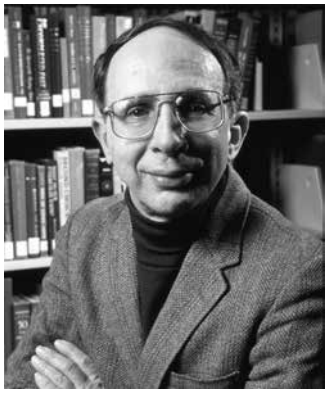
28. Prospective applications for deterrence theory as well as its limitations receive expert appraisal in Patrick M. Morgan, "The State of Deterrence in International Politics Today," *Contemporary Security Policy* 33, no. 1 (April 2012): 85–107. On deterrence and rationality, see Patrick M. Morgan, *Deterrence Now* (Cambridge, UK: Cambridge University Press, 2003), 42–79.

29. Morgan, "State of Deterrence," 97.

30. Additional and very useful analysis of this case appears in Steven R. David, *Armed and Dangerous: Why a Rational, Nuclear Iran Is an Unacceptable Risk to Israel* (Ramat Gan, Israel: Begin-Sadat Center for Strategic Studies, Bar-Ilan University, November 2013).

31. Lawrence J. Korb and Alexander Rothman, "No First Use: The Way to Contain Nuclear War in South Asia," *Bulletin of the Atomic Scientists* 68, no. 2 (2012): 34–42.

32. Bracken, *Second Nuclear Age*, 262–67.



**Dr. Stephen J. Cimbala**

Dr. Cimbala (BA, Penn State; MA, PhD, University of Wisconsin–Madison) is Distinguished Professor of Political Science at Penn State–Brandywine and the author of numerous works in international security, arms control, national security policy, and other fields. An award-winning Penn State teacher, Dr. Cimbala has recently authored *The New Nuclear Disorder: Challenges to Deterrence and Strategy* (Ashgate, 2015). He is also coauthor (with Sam C. Sarkesian and John Allen Williams) of the widely used text *US National Security: Policymakers, Processes and Politics* (Lynne Rienner, 2013).

# US Nuclear Weapons and Deterrence

## Realist versus Utopian Thinking©

Dr. Keith B. Payne

A debate over the future of the US nuclear arsenal is at a pivotal moment. The Obama administration has proposed to Congress a budget that calls for modernization of the US "nuclear triad" of missiles, submarines, and bombers. This proposal is notable because presidential administrations and Congress have largely neglected US nuclear forces for over two decades; consequently, each part of the triad has aged or is aging rapidly, and according to *National Security and Nuclear Weapons in the 21st Century* (2008), "The United States does not have the ability to produce new nuclear weapons."[1]

The Congressional Budget Office notes that the Department of Defense will spend $15.4 billion on nuclear-weapons modernization in 2015—less than 3 percent of the department's budget—and only slightly more ($15.9 billion) in fiscal year 2016. If the fledgling programs now requested are killed or further delayed, the US nuclear arsenal—already reduced by 80 percent since the end of the Cold War—will be further disarmed by neglect as the aging missiles, submarines, and bombers reach the end of their scheduled and extended service lives.[2]

The congressional defense budget hearings now under way reveal the fragility of the multiyear US nuclear modernization plan. For example, Frank Kendall, undersecretary of defense for acquisition, technology, and logistics, reported to the Senate that under current defense budget projections, the United States will have "affordability problems" in producing the replacement for the existing submarine element of the nuclear triad.[3]

The administration's proposed budget and modernization plan have met with strong opposition, particularly from nuclear utopians, who insist that the United States should either delay or skip triad modernization, make further deep reductions in the remaining US nuclear arsenal, or even eliminate it altogether. In contrast, nuclear realists believe that, given the rapid aging of the US triad, the increasing belligerence of Russia and China, and their buildup of nuclear forces, prudence now demands that the United States update its nuclear arsenal and pause from further reductions below those already scheduled in the 2010 New Strategic Arms Reduction Treaty (START).

The fissure between nuclear utopians and nuclear realists has at various times been attributed to greater and lesser concern about nuclear war, respectively, or greater or lesser intellectual maturity.[4] One eccentric explanation even presents the fundamental difference in Freudian terms (i.e., "acute missile envy").[5] Differences in academic credentials, the desire to prevent nuclear war, or emotional maturity do not divide nuclear utopians and nuclear realists, however. The distinction separating these rival lines of thought is their fundamentally different underlying understandings of international relations and the functioning of nuclear deterrence.

Utopians tend to believe that international cooperation, norms, and institutions—not nuclear deterrence—have prevented nuclear war and can do so in the future. As Rose Gottemoeller, undersecretary of state for arms control and international security, claimed in a recent speech, "We have been spared that fate because we created an intricate and essential system of treaties, laws and agreements."[6] It is said that with sufficient political will, action, vision, and faith, world leaders can agree to renounce nuclear weapons via the creation of international legal structures and institutions that will provide peaceful approaches to conflict resolution as an alternative to nuclear arms and deterrence.[7]

Nuclear realists, however, point out that in severe security crises across all time, international cooperative norms and legal structures have been superseded by the imperative of the hour. Hence, in 1914 Germany justified its violation of Belgium's neutrality as necessary in defense of its national security, and in 1940 Great Britain violated Norway's neutrality to counter the mounting German threat. Furthermore, in 1940 Britain attacked the French naval base at Mers-el-Kébir on the coast of then-French Algeria, killing almost 1,300 French servicemen. Britain took this action against its erstwhile ally for fear that Germany otherwise would take the French ships and tip the naval balance in its favor. The respective German and British justifications for these military actions are remarkably similar—that is, the highest calling of national security demanded them.

These and countless similar examples reflect the powerful international norm of *raison d'État (the primacy of state interest over opinions regarding cooperation, morality, or international law)*. Realists do not celebrate this norm but recognize its existence and potency. The perceived requirements of national security ultimately trump the constraining effect of international opinion, norms, and law and create an essentially anarchic "self-help" security environment.[8] The great ancient Greek historian Thucydides put it starkly in the Melian Dialogue: "The strong do what they can and the weak suffer what they must."[9] The frequent demonstration of the reality of this observation in international relations, not folly or malevolence, leads many states

to seek nuclear capabilities if they are able or to rely on the nuclear capabilities of a powerful ally.

Utopians claim that the imperative of national security underlying the felt need for nuclear protection can be superseded by the rise of an alternative countervailing norm and international institutions that buttress global collective security, peaceful conflict resolution, and nuclear disarmament. As noted, this unprecedented global norm would, they say, be established via international political will, leadership, and faith.[10] Leaders so equipped and inspired could seek to overcome the age-old international context described by Thucydides with global legal institutions and mutual trust rather than insecurity and mistrust.

It is not an overstatement, however, to observe that the global establishment of a powerful, effective cooperative norm and corresponding international institutions that can be trusted to control aggression and provide protection globally would represent an unprecedented reordering of the international system. Once such a reordering is in place, utopians are correct in saying that it could create the international security context necessary for nuclear disarmament. History, however, gives no indication of its possibility, and in its absence Thucydides and the norm of *raison d'État* will continue to prevail. As the bipartisan Congressional Commission on the Strategic Posture of the United States (Perry-Schlesinger Commission) recognized, "The conditions that might make possible the global elimination of nuclear weapons are not present today and their creation would require a fundamental transformation of the world political order."[11]

Realists in this regard are from Missouri, the "show me" state, and ask utopians to explain how, why, and when a powerful new cooperative international norm with corresponding international institutions will become a reality. Realists point to the unhappy history of the unmet claims and dashed hopes of the 1928 Kellogg-Briand Pact (intended to prevent offensive war by global legal agreement), the League of Nations, and the United Nations. To be sure, the future does not have to be bound by the past, but before moving further toward nuclear disarmament, realists want to see some clear evidence of the emerging transformation of the global order—not just the claim that it can occur if all key leaders are so willing, faithful, and visionary and can "embrace a politics of impossibility."[12] As the old English proverb says, "If wishes were horses, then beggars would ride."

But has not everything changed in the twenty-first century? Has not the end of the Cold War ushered in a new global commitment to cooperation, the rule of law globally, and benign conflict resolution? The unarguable answer is no. Russian military actions against Georgia in 2008 and Ukraine since 2014 (the latter in direct violation of the 1994 Budapest Memorandum signed by Russia, Great Britain, and the United States) are sufficient empirical evidence to demonstrate that Thucydides' stark description of reality is alive and well. China's expansionist claims and military pressure against its neighbors in the East and South China Seas teach the same lesson.

Why is this reality significant in the consideration of nuclear weapons? Because in the absence of reliably overturning the powerful norm of *raison d'État* and Thucydides' explanation of international relations, states with the capability and felt need will continue to demand nuclear capabilities for their own protection and,

in some cases, to provide cover for their expansionist plans. To wit, if Ukraine had retained nuclear weapons, would it now fear for its survival at the hands of Russian aggression? Former Ukrainian defense minister Valeriy Heletey and members of the Ukrainian parliament have made this point explicitly, lamenting Ukraine's transfer of its nuclear forces to Russia in return for now-broken security promises of the Budapest Memorandum.[13]

This lesson cannot have been lost on other leaders considering the value of nuclear weapons. Nor is it a coincidence that US allies in Central Europe and Asia are becoming ever more explicit about their need for US nuclear assurances under the US extended nuclear deterrent (i.e., the nuclear umbrella). They see no new emerging, powerful global collective security regime or cooperative norms that will preserve their security; thus, they understandably seek the assurance of power, including nuclear power. The Polish Foreign Ministry observed in a recent press release that "the current situation reaffirms the importance of NATO's nuclear deterrence policy."[14] This reality stands in stark contrast to utopian claims that powerful new global norms and international institutions will reorder the international system, overturn Thucydides, and allow individual states to dispense with nuclear weapons or the nuclear protection of a powerful ally. As the Socialist French president Francois Hollande has said, "The international context does not allow for any weakness. . . . The era of nuclear deterrence is therefore not over. . . . In a dangerous world—and it is dangerous—France does not want to let down its guard. . . . The possibility of future state conflicts concerning us directly or indirectly cannot be excluded."[15] There could be no clearer expression of Thucydides' description of international relations and its contemporary implications for nuclear weapons.

Opponents of the administration's plan to modernize the US triad now double down on the utopian narrative by insisting that the United States instead lead the way in establishing the new global norm by showing that Washington no longer relies on nuclear weapons and does not seek new ones. Washington cannot expect others to forgo nuclear weapons if it retains them, they say, and thus it must lead in creation of the new norm against nuclear weapons by providing an example to the world. For instance, "by unilaterally reducing its arsenal to a total of 1,000 warheads, the United States would encourage Russia to similarly reduce its nuclear forces without waiting for arms control negotiations."[16] A good US example supposedly can help "induce parallel" behavior in others.[17] If, however, the United States attributes continuing value to nuclear weapons by maintaining its arsenal, "other countries will be more inclined to seek" them.[18]

Nuclear realists respond, however, that the United States already has reduced its nuclear forces deeply over the last 25 years. America cut its tactical nuclear weapons from a few thousand in 1991 to a "few hundred" today.[19] Moreover, US-deployed strategic nuclear weapons have been cut from an estimated 9,000 in 1992 to roughly 1,600 accountable warheads today, with still more reductions planned under the New START Treaty.[20] The United States has even decided to be highly revealing of its nuclear capabilities to encourage others to do so, with no apparent effect on Russia, China, or North Korea.[21] America has adhered fully to the reductions and restrictions of the 1987 Intermediate-Range Nuclear Forces Treaty—the "centerpiece of arms control"—but the Russians now are in open violation. As former undersec-

retary of state Robert Joseph stated recently, decades of deep US reductions "appear to have had no moderating effect on Russian, Chinese or North Korean nuclear programs. Neither have U.S. reductions led to any effective strengthening of international nonproliferation efforts."[22] Utopians want the United States to lead the world toward nuclear disarmament by its good example, but no one is following.

The basic reason, realists point out, is that foreign leaders make decisions about nuclear weaponry based largely on their countries' strategic needs, *raison d'État*, not in deference to America's penchant for nuclear disarmament or some sense of global fairness. A close review of India by S. Paul Kapur, for example, concluded that "Indian leaders do not seek to emulate US nuclear behavior; they formulate policy based primarily on their assessment of the security threats facing India."[23] The same self-interested calculation is true for other nuclear and aspiring nuclear states.

Nations that are a security concern to the United States seek nuclear weapons to intimidate their neighbors (including US allies), to counter US conventional forces, and to gain a free hand to press their regional military ambitions. They see nuclear weapons as their trump cards and do not follow the US lead in nuclear disarmament. A bipartisan expert working group at the Center for Strategic and International Studies concluded accordingly that "U.S. nuclear reductions have no impact on the calculus of Iran and North Korea."[24]

Nuclear realists also note that many allies have given up the nuclear option because America provides a "nuclear umbrella" for their protection. The United States reportedly has now offered this nuclear umbrella to Middle Eastern states that otherwise could go nuclear for fear of a prospective Iranian nuclear bomb.[25] Japanese and South Koreans have said that if the US nuclear umbrella loses credibility, they will be compelled to find security alternatives, including reconsideration of nuclear capabilities. In short, further US nuclear reductions may inspire nuclear proliferation—not prevent it as claimed by critics of US nuclear modernization.

Nuclear utopians and nuclear realists simply perceive international relations differently, with corresponding great effect on their views of nuclear deterrence and weapons. Seeing an orderly system that functions predictably and increasingly amicably, utopians make two confident predictions as the basis for further deep US nuclear reductions. The first is that US deterrence will work reliably even with a relatively small nuclear arsenal or nuclear zero. Specifically, they offer confident claims that a specific number or level of US nuclear weapons will be adequate for America's deterrence goals. That number often is associated with the capability deemed adequate to threaten an opponent's societal infrastructure with destruction—a relatively small number of nuclear weapons: "From a practical perspective, several second-strike nuclear weapons are more than enough to keep the most aggressive adversary at bay."[26] Or, "deterrence today would remain stable even if retaliation against only ten cities were assured."[27] And, "no current or conceivable future threat requires the United States to maintain more than a few hundred survivable warheads."[28] Such predictions abound in the public debate. They are offered with great certainty by those recommending deep US nuclear force reductions, presumably because they feel the need to assure us that deterrence will not be degraded by the deep nuclear force reductions they recommend.

Yet, such predictions simply assume that a specific number of weapons or specific type of threat will produce the desired deterrent effect on the premise that all rational opponents *should be deterred by such a threat*. The capability for posing a threat, though, does not equate to a predictable deterrent effect—or indeed any deterrent effect. In truth, no one, however credentialed, can make such promises with any credibility because the functioning of deterrence is shaped by many factors—some known and others opaque, including enormous variations in leadership perceptions and calculations. Only an omniscient observer could claim to know that a specific number of nuclear weapons will be adequate for deterrence, now or in the future. As a recent National Academy of Sciences study noted in this regard,

> Finally, models of human beings and their individual and collective behaviors must necessarily include a large amount of inherent uncertainty. This uncertainty is not a flaw of the model and cannot be designed out of the model. Human behavior is dynamic and adaptive over time, and it is impossible at the moment (and into the foreseeable future) to make exact predictions about that behavior.[29]

In short, deterrence is a human construct based on the functioning of human perceptions and calculations that are affected by multiple factors beyond confident prediction. Its functioning remains unpredictable and fallible, and confident claims about the deterrent effect of "several," "10," or a "few hundred" weapons reflect a utopian pretense of omniscience.

The second typical prediction is that Russia and China will pose no severe military threats to the United States and its allies and that their differences with the United States will be resolved without reference to nuclear capabilities. For example, the 2012 report by the Global Zero Commission claimed that "the risk of nuclear confrontation between the United States and either Russia or China belongs to the past, not the future."[30]

Nuclear realists have no confidence in such predictions, which again can come only from the utopian pretense of omniscience. Prior to the nuclear age, they point out, great powers periodically came into intense conflict, and deterrence relying on conventional forces failed to prevent catastrophic wars. The Concert of Europe failed to stop the descent into World War I, and the League of Nations collapsed during the lead-up to World War II. Since 1945, however, a powerful US nuclear arsenal appears to have had a decisive effect in deterring the outbreak of World War III and in containing regional crises and conflicts. Yet, nuclear utopians want to reduce this arsenal deeply or eliminate it.

Instead of the utopians' vision of an orderly, predictable, and benign world order, realists see international relations as fluid, often dangerous, and unpredictable, as they have been for millennia and as described by Thucydides. Realists point to the frequent history of international relations worsening rapidly and surprisingly; they see no indication of an emerging and amicable new world order. The current unexpected Russian aggression in Europe is a cold reminder of this reality. In January prominent Russian journalist Alexander Golts warned that "the West had forgotten how it had used nuclear deterrence to coexist with the Soviet Union. Now it will have to open up that playbook once more."[31]

In truth, Thucydides and *raison d'État* rein over international relations, and sovereign power remains the ultimate currency in a self-help international system with a near-global lack of security and trust. Deterrence, including nuclear deterrence, correspondingly remains important—but it is both fallible and unpredictable. The utopian-proffered solution of nuclear disarmament must await the fundamental reordering of international relations—the hope for which seems remarkably utopian. What can be done, given this distressing situation?

The realist response is clear but not fully satisfactory because realism offers no infallible, complete solution to conflict in the international system and the related question of deterrence and its nuclear requirements: deterrence must be made as effective as possible to prevent war and the escalation of hostilities. This goal likely requires (1) as complete an understanding as is possible of opponents' perceptions and values so as to tailor US deterrence strategies appropriately to the opponent and deterrent goal and (2) a broad spectrum of flexible and resilient US conventional and nuclear capabilities to help the United States deter as effectively as possible across a broad spectrum of contingencies and potential opponents with varying goals, values, perceptions, and modes of decision making. The number of US weapons and platforms is one, but only one, potentially important measure of a flexible and resilient force structure.[32] Equally important, the potential for deterrence failure must be recognized via the provision of indirect and direct US defensive capabilities. Defenses cannot ensure the safety of all people in all scenarios, to be sure—but they could help save lives and mitigate destruction in many. It must be acknowledged that this combination of deterrence and defensive measures can neither fully eliminate the risk of war nor ensure the safety of all—that too would be a utopian expectation. But only the pretense of a more credible solution and safety resides in the utopian expectation of a cooperative new world order that ushers in nuclear disarmament—or in vapid promises that a small, narrow set of US strategic capabilities surely will deter reliably now and in the future.

In summary, contemporary evidence and all of history argues against the utopians' predictable, amicable world in which a potent cooperative norm and international law have supplanted *raison d'État and Thucydides' description of international relations*. Decisions made now that would cause further erosion of the US nuclear arsenal would take decades to reverse, create fear among key allies, and likely inspire foes to challenge a United States that appears less able to deter in the hard times ahead. These are the stakes in the current debate. ✪

## Notes

1. Department of Energy and Department of Defense, *National Security and Nuclear Weapons in the 21st Century* (Washington, DC: Department of Energy and Department of Defense, September 2008), 2, http://www.defense.gov/news/nuclearweaponspolicy.pdf.

2. "Fact Sheet: Increasing Transparency in the U.S. Nuclear Weapons Stockpile," Department of Defense, 3 May 2010, http://www.defense.gov/npr/docs/10-05-03_Fact_Sheet_US_Nuclear_Transparency__FINAL_w_Date.pdf.

3. Senate, *Hearing to Receive Testimony on U.S. Nuclear Weapons Policy, Programs, and Strategy in Review of the Defense Authorization Request for Fiscal Year 2016 and the Future Years Defense Program*, Committee on Armed Services, Subcommittee on Strategic Forces, 114th Cong., 1st sess., 4 March 2015, http://www.armed-services.senate.gov/imo/media/doc/15-20%20-%203-4-15.pdf.

4. Ivan Oelrich, *Missions for Nuclear Weapons after the Cold War*, Occasional Paper no. 3 (Washington, DC: Federation of American Scientists, January 2005), 8, http://fas.org/pubs/_docs/01282005175922.pdf; and Robert R. Holt, "Meeting Einstein's Challenge: New Thinking about Nuclear Weapons," *Bulletin of the Atomic Scientists*, 3 April 2015, http://thebulletin.org/meeting-einstein%E2%80%99s-challenge-new-thinking-about-nuclear-weapons8166.

5. Helen Caldicott, *Missile Envy: The Arms Race and Nuclear War*, rev. ed. (New York: Bantam Books, 1986), 235.

6. Rose Gottemoeller, "Arms Control Priorities for Russia and the United States in 2015 and Beyond" (remarks delivered at the Exchange Monitor's Seventh Annual Nuclear Deterrence Summit, Washington, DC, 18 February 2015), http://www.state.gov/t/us/2015/237581.htm.

7. See, for example, Richard Falk and David Krieger, eds., *At the Nuclear Precipice: Catastrophe or Transformation?* (New York: Palgrave Macmillan, 2008); and Richard Falk and David Krieger, *The Path to Zero: Dialogues on Nuclear Dangers* (Boulder, CO: Paradigm Publishers, 2012).

8. For the classic presentation, see Kenneth N. Waltz, *Man, the State and War: A Theoretical Analysis* (New York: Columbia University Press, 1959).

9. Robert B. Strassler, ed., *The Landmark Thucydides: A Comprehensive Guide to the Peloponnesian War* (New York: Touchstone, 1996), 352.

10. Richard Falk and David Krieger, "Introduction," in Falk and Krieger, *At the Nuclear Precipice*, 6, 10.

11. William Perry and James R. Schlesinger et al., *America's Strategic Posture: The Final Report of the Congressional Commission on the Strategic Posture of the United States* (Washington, DC: United States Institute of Peace Press, 2009), xvi, http://media.usip.org/reports/strat_posture_report.pdf.

12. Falk and Krieger, *Path to Zero*, 201.

13. See Oren Dorell, "Ukraine May Have to Go Nuclear, Says Kiev Lawmaker," *USA Today*, 11 March 2014, http://www.usatoday.com/story/news/world/2014/03/10/ukraine-nuclear/6250815/; Anastasiya Kravenchko, "Ukraine Could Develop Nuclear Bomb in 10 Years," *Isvestiya*, 17 September 2014; and "Russian Experts Comment on Prospects of Ukraine Acquiring Nuclear Weapons," *BBC Monitoring*, 2 October 2014.

14. "MFA Statement on Information about Russia's Non-compliance with the INF Treaty," press release, Republic of Poland, Ministry of Foreign Affairs, 30 July 2014, http://www.msz.gov.pl/en/news/mfa_statement_on_information_about_russia_s_non_compliance_with_the_inf_treaty.

15. Quoted in "'Dangerous World': France Has Less Than 300 Nukes and Still Needs Them," Reuters, 20 February 2015, http://rt.com/news/234099-france-details-nuclear-arsenal/.

16. Bruce G. Blair et al., *Toward True Security: Ten Steps the Next President Should Take to Transform U.S. Nuclear Weapons Policy* (Cambridge, MA: Federation of American Scientists, Natural Resources Defense Council, Union of Concerned Scientists, February 2008), 18, http://www.ucsusa.org/assets/documents/nwgs/toward-true-security.pdf.

17. George Perkovich, *Do unto Others: Toward a Defensible Nuclear Doctrine* (Washington, DC: Carnegie Endowment for International Peace, 2013), 61, http://carnegieendowment.org/files/do_unto_others.pdf.

18. Stephen Young, "Obama's Nuclear Legacy #4: Give Nuclear Weapons a Sole Purpose," Union of Concerned Scientists, 23 February 2015, http://allthingsnuclear.org/sole-purpose/.

19. Gary Samore, coordinator for arms control and weapons of mass destruction terrorism, National Security Council, quoted in "Obama Adviser Gary Samore: 'The Ball Is Very Much in Tehran's Court' " (interview), Radio Free Europe / Radio Liberty, 14 April 2011, http://www.rferl.org/content/interview_samore_russia_iran_us_policy/3557326.html; and "Transparency in the U.S. Nuclear Weapons Stockpile," fact sheet, Department of State, 29 April 2014, http://www.state.gov/t/avc/rls/225343.htm.

20. Robert S. Norris and William M. Arkin, "Table 2.1: US Strategic Nuclear Forces, January 1992," in Stockholm International Peace Research Institute, *SIPRI Yearbook 1992: World Armaments and Disarmament* (New York: Oxford University Press, 1992), 74; and Department of State, Bureau of Arms Control, Verification and Compliance, "New START Treaty Aggregate Numbers of Strategic Offensive Arms," fact sheet, 1 January 2015, http://www.state.gov/t/avc/rls/235606.htm.

21. Paul Meyer, Henrik Salander, and Zia Mian, "Why the NPT Needs More Transparency by the Nuclear Weapons States," *Bulletin of the Atomic Scientists*, 8 April 2015, http://thebulletin.org/why-npt-needs-more-transparency-nuclear-weapon-states8188.

22. Quoted in Keith B. Payne, "Why the 'Nuclear Utopians' Are Wrong," *Wall Street Journal*, 15 March 2015, http://www.wsj.com/articles/keith-payne-the-nuclear-utopians-are-wrong-1426457846.

23. S. Paul Kapur, "More Posture than Review," *Nonproliferation Review* 18, no. 1 (March 2011): 69.

24. Clark A. Murkock, Stephanie Spies, and John K. Warden, *Forging a Consensus for a Sustainable U.S. Nuclear Posture* (Washington, DC: Center for Strategic and International Studies, April 2013), viii, http://csis.org/files/publication/130422_Spies_ForgingConsensus_Web.pdf.

25. Shabtai Gold, "Report: U.S. to Offer Gulf States Nuclear Umbrella against Iran," *Haaretz*, 5 March 2015, http://www.haaretz.com/news/middle-east/1.645573#!.

26. James Wood Forsyth Jr., B. Chance Saltzman, and Gary Schaub Jr., "Minimum Deterrence and Its Critics," *Strategic Studies Quarterly* 4, no. 4 (Winter 2010): 7, http://www.au.af.mil/au/ssq/2010/winter/winter10.pdf.

27. Bruce Blair et al., "Smaller and Safer: A New Plan for Nuclear Postures," *Foreign Affairs* 89, no. 5 (September/October 2010): 10, https://www.foreignaffairs.com/articles/russian-federation/2010-09-01/smaller-and-safer.

28. Blair et. al., *Toward True Security*, 18.

29. Greg L. Zacharias, Jean MacMillan, and Susan B. Van Hemel, eds., *Behavioral Modeling and Simulation: From Individuals to Societies* (Washington, DC: National Academies Press, 2008), 355.

30. James Cartwright et al., *Modernizing U.S. Nuclear Strategy, Force Structure and Posture*, Global Zero US Nuclear Policy Commission Report (Washington, DC: Global Zero, May 2012), 6, http://www.globalzero.org/files/gz_us_nuclear_policy_commission_report.pdf.

31. Alexander Golts, "Russia Is Turning into a Rogue State," *Moscow Times*, 26 January 2015, http://www.themoscowtimes.com/opinion/article/russia-is-turning-into-a-rogue-state/514899.html.

32. Dr. Keith B. Payne and Dr. John S. Foster Jr., *Nuclear Force Adaptability for Deterrence and Assurance: A Prudent Alternative to Minimum Deterrence* (Fairfax, VA: National Institute Press, 2014), http://www.nipp.org/wp-content/uploads/2014/12/MD-II-for-web.pdf.

**Dr. Keith B. Payne**

Dr. Payne (AB, University of California–Berkeley; PhD, University of Southern California) is professor and head of the Graduate Department of Defense and Strategic Studies, Missouri State University (Washington Campus). He is also president and cofounder of the National Institute for Public Policy, a nonprofit research center located in Fairfax, Virginia. Dr. Payne served in the Department of Defense as the deputy assistant secretary of defense for forces policy. In 2003 he received the Department of Defense Medal for Distinguished Public Service; in 2005, the Vicennial Medal for his many years of graduate teaching at Georgetown University; and in 2013, the Chief Scientist's Medal for Excellence, Global Strike Command. He is the author or coauthor of over 30 books and monographs as well as 150 published articles, including the 2009 report of the bipartisan Congressional Commission on the Strategic Posture of the United States (Perry-Schlesinger Commission).

**Let us know what you think! Leave a comment!**



**http://www.airpower.au.af.mil**

# Increasing Uncertainty

## The Dangers of Relying on Conventional Forces for Nuclear Deterrence

Jennifer Bradley

> *To put an end to Cold War thinking, we will reduce the role of nuclear weapons in our national security strategy, and urge others to do the same.*
>
> —President Barack Obama

In his now-famous Prague speech in 2009 shortly after taking office, President Obama laid out his vision for a world without nuclear weapons.[1] Although he had no timeline for reaching this goal, noting that it might not even occur in his lifetime, part of the pathway to that objective involved reducing the role of nuclear weapons in US national security strategy. The *Nuclear Posture Review* (*NPR*), released one year later, further defined and codified his vision for the security of the United States and its allies.[2] Five years later, some of the implications of how this decision affects the US deterrent relationship with both Russia and China are becoming apparent.

Arguably, these two are the United States' most important relationships and should serve as the cornerstone of US nuclear deterrence policy. Although Russia and China are not identified as adversaries of the United States, neither are they considered allies. Potential always exists for the relationship to sour, and in the case of Russia, that is exactly what has happened over the past year. The US decision to meet the needs of deterrence by relying less on nuclear weapons and instead developing conventional weapons that can have strategic effects may not have had the intended deterrent effect on Russia and China. Far from encouraging them to reduce the importance of nuclear weapons in their national security strategy, it may have inspired them to rely more on nuclear weapons to meet their security needs. Doing so could create dangerous instability in deterrence relationships.

## The Simplicity of Deterrence Theory

Deterrence theory is beautiful in its simplicity. At its essence, the theory is a military strategy in which one power uses the threat of assured retaliation to convince an enemy not to attack. Some people have the misconception that deterrence did not come into existence until after the invention of nuclear weapons, but it has been used as a tool of statecraft, with varying degrees of success and failure, since ancient times.[3]

The destructive power of nuclear weapons brought deterrence theory to the forefront of US national security strategy. In 1946 Bernard Brodie commented on this phenomenon: "Thus far the chief purpose of our military establishment has been to win wars. From now on its chief purpose must be to avert them. It can have almost no other useful purpose."[4] The dawn of the nuclear age spurred a tremendous amount of intellectual study and debate on deterrence as well as the ingredients necessary to achieve it. Deterrence became the cornerstone of US security strategy during the latter half of the twentieth century. However, debate on its relevance to twenty-first-century threats continues today.

## Precarious Challenge of Deterrence in Practice

As simple as deterrence is to define, its actual practice is far more complicated, having many potential pitfalls for failure, essentially because it is a psychological function in the mind of the adversary. Consequently, success is difficult to predict or prove, and deficiencies may become apparent only when deterrence fails. Further, the definition of deterrence theory is evolving to meet the challenges of the current security environment. Scholars recognized that the Cold War deterrence framework focused solely on deterring the Soviet Union and was inadequate to address the national security issues of the twenty-first century. Today, because the United States faces deterrence problems from multiple actors, our strategy needs to be "tailored to the perceptions, values, and interests of specific adversaries."[5]

An acknowledgment also exists that a cost-imposition deterrence strategy may prove inadequate to decisively influence a foe's decision making. The adversary considers more factors than simply the costs associated with a contemplated action. Rather, he compares the costs of a course of action to the benefits sought and examines the consequences of not acting. That is, even if an enemy believes that the costs are credible and will be incurred, deterrence can still fail because he perceives that the consequences of restraint are so much greater.[6] This belief demands that our deterrence strategies consider adversary perceptions of both the costs and benefits of a course of action as well as those of restraint. Strategies should be tailored to decisively influence the opponent's decision making by credibly threatening to impose costs, deny benefits, and encourage restraint by convincing the actor that restraint will result in an acceptable outcome.[7]

As mentioned above, at its core, deterrence is a psychological function. Understanding the adversary, including his leadership characteristics, historical and cultural influences, decision-making structures and processes, and national security strategy and doctrine, is essential to crafting a deterrence strategy. Because deter-

rence happens in the mind of the enemy, "the requirements for deterrence will differ with each party that we might try to deter and may well differ in each circumstance or scenario."[8] Further complicating the functioning of deterrence, the foe must understand the United States and comprehend its threats and communications, believing that they are credible and that the United States possesses the will to impose them.[9] Failure to consider the individual characteristics of an actor during development of a deterrence strategy increases the risks of failure.

## Reduced Emphasis on Nuclear Weapons

The first priority of the *NPR* was to reduce the dangers of nuclear proliferation and the threats of nuclear terrorism. Part of the road map to this goal involved diminishing the reliance on nuclear weapons in US security strategy. The rationale was that by demonstrating its commitment to downsizing the role and numbers of nuclear weapons, the United States would "persuade our NPT [Nuclear Non-Proliferation Treaty] partners to join with us in adopting the measures needed to reinvigorate the non-proliferation regime and secure nuclear materials worldwide against theft or seizure by terrorist groups."[10]

Part of the reasoning for this modification was the changing strategic environment in general and the beneficial relationships with Russia and China specifically. Both Obama's Prague speech and the *NPR* called for the "end of Cold War thinking" and extolled fundamental changes in the US-Russia relationship.[11] The *NPR* went so far as to say that "Russia and the United States are no longer adversaries, and prospects for military confrontation have declined dramatically."[12] For China, the *NPR* was less clear on how the US-China relationship was changing for the better. Instead, it focused on interdependence between the United States and China and mutual interests in reducing the risks associated with terrorism and the proliferation of weapons of mass destruction.[13] The notion in the *NPR* was that the changing strategic environment created by an improved relationship with Russia and the interdependence with China meant that the United States no longer needed to rely on nuclear weapons to meet its security needs with regard to these two nuclear power relationships; furthermore, it maintained that this positive trajectory would continue.

## Increased Emphasis on Conventional Forces

To bridge the gap between the reduced reliance on nuclear weapons and capabilities needed to meet US security needs, the *NPR* proposed that the United States continue to strengthen its unrivaled conventional capabilities.[14] Although the report declared that "the United States today has the strongest conventional military forces in the world [and that] our close allies and partners field much of the rest of the world's military power," it proposed additional capabilities to further increase the strength of US conventional forces.[15]

One of the conventional enhancements proposed was conventional long-range missiles. The United States began development of Conventional Prompt Global Strike (CPGS) doctrine in 2003 and continues to pursue it today, with plans to in-

vest approximately $2 billion between 2011 and 2016.[16] CPGS could hit targets anywhere on the earth within an hour. Its weapons could be based either in the United States or on submarines at sea, giving the US military a conventional precision-strike capability that could be delivered in a short amount of time.[17]

According to the Global Zero US Nuclear Policy Commission, the increased lethality and precision of advanced conventional weapons allow the United States to hold at risk enemy targets that, at one time, were susceptible only to nuclear weapons. Furthermore, the commission observed that these weapons would have a greater deterrent effect because they were more "usable" than nuclear weapons. Moreover, the commission's research showed that a significant number of targets in Russia and China, once vulnerable only to US nuclear weapons, would be threatened by precision conventional forces.[18] Additionally, as US capabilities and investments improve, more targets would become vulnerable to conventional capabilities, enabling the administration to reduce the role of nuclear weapons even further.

The significance of the assertions of the commission's report is the suggestion that nuclear weapons could be replaced by advanced US conventional capabilities having the same strategic-level effects but with more usable weapons.[19] However, missing from the report was an assessment of how Russia or China would interpret such a change in US deterrence posture.

## Foreign Perspective

The security environment has changed dramatically in the five years since the *NPR*'s publication—but not for the better, as the policy document hoped for. Although the downturn in the security environment cannot be correlated to the change in US nuclear policy, some dangerous implications regarding both Russia and China are linked to the United States' decision to lower its emphasis on nuclear weapons in its security strategy. Arguably, the nuclear deterrent relationships with Russia and China are the ones most important to the United States, so it is imperative to continue to monitor their health and status.

As the *NPR* has been implemented over the last five years and the United States has decreased its emphasis on nuclear weapons while increasing its investment in advanced conventional weapons, Russia and China have responded in ways that the US government may not have anticipated. As outlined above, deterrence occurs in the mind of the adversary, and as adjustments to deterrence policy and strategy occur, they should be evaluated to determine their effect on the enemy's decision making.

### *Russian Perspective*

Much was made in the *NPR* of the improved dealings between the United States and Russia. With the end of the Cold War rivalry, the United States no longer needed to rely on nuclear weapons to meet its security needs. Further, even though it recognized the policy differences that remained between both nations and that Russia continued to modernize its nuclear forces, the growing cooperation between

the United States and Russia on shared interests as well as the low probability of conflict was enough for the *NPR* to declare that Russia was no longer an enemy.[20]

As glowingly as the *NPR* painted the affiliation between the United States and Russia, it is clear that Russia did not view the relationship in the same light. Anti-Americanism has a long tradition in the former Soviet Union and continues in modern Russia. Prior to the US-led "reset" in US-Russia relations in 2009, Russian leaders consistently referred to the United States as their principal adversary.[21] Further, the Russians believed they were under threat by the North Atlantic Treaty Organization (NATO), led by the United States.[22] This perception of the United States remained consistent after the reset, and, in fact, the relationship has deteriorated.

After the collapse of the Soviet Union, Russia's conventional military capabilities atrophied and deteriorated. In 2000 to compensate for perceived conventional weakness, Russian military doctrine potentially lowered the threshold for nuclear use, declaring that Russia "keep[s] the right to use nuclear weapons in response to the use of nuclear weapons or other WMD [weapons of mass destruction] against Russia or its allies, as well as in response to large-scale conventional aggression in critical situations for Russian national security."[23] Russia released an updated nuclear doctrine just prior to the release of the *NPR*. It did not significantly raise the threshold for nuclear use, observing that Russia reserved the right to use nuclear weapons "in the event of aggression against the Russian Federation involving the use of conventional weapons when the very existence of the state is under threat."[24]

Russia has witnessed the United States and its allies use their conventional military power successfully and repeatedly since the first Gulf War in 1991. The dichotomy between the United States' and Russia's conventional military power has led Russia to depend on its nuclear forces to deter not only nuclear attack but also conventional conflict with the United States. Further, as the United States develops conventional weapons capable of executing strategic missions, coupled with missile defenses, Russian leaders fear that such developments would negate their ability to retaliate and successfully deter the United States.[25] The latest version of Russian military doctrine, released in 2014, articulates this fear: "The creation and deployment of global strategic antiballistic missile systems that undermines the established global stability and balance of power in nuclear missile capabilities, the implementation of the 'prompt strike' concept, intent to deploy weapons in space and deployment of strategic conventional precision weapons" are among the major foreign threats.[26]

Russia places very high value on its nuclear arsenal. Without it, Russia's leadership recognizes that the nation is fundamentally weak. Its status as a nuclear peer to the United States makes it "a state of significance, interest, or consequence."[27] As such, Russia has made modernizing its strategic forces one of the country's highest priorities. Part of this modernization program includes development of a class of nuclear weapons eliminated with the signing of the Intermediate-Range Nuclear Forces Treaty in 1987. Evidence of a Russian treaty violation dates back to 2007, but the United States did not formally charge Russia with misconduct until 2014.[28] The treaty banned ground-launched ballistic and cruise missiles with ranges between 500 to 5,000 kilometers. Such missiles can execute short-warning attacks on strategic targets throughout European NATO countries.[29]

The value that Russia places on its status as a nuclear power was brought into sharp relief after its annexation of Crimea from Ukraine in 2014. On multiple occasions, Russian leadership used nuclear signaling, such as President Vladimir Putin declaring that "Russia is one of the most powerful nuclear nations" as a way of deterring the United States and NATO from intervening.[30] Further, Russian foreign minister Sergei Lavrov stated that Russia could deploy nuclear weapons to Crimea without violating international law since the region was now part of Russia.[31] Russia continues to signal with its nuclear weapons, conducting large-scale nuclear exercises, probing the defenses of NATO allies with nuclear-capable bombers, and issuing statements regarding Russia's nuclear readiness.

### *Chinese Perspective*

The *NPR* paid much less attention to the deterrent relationship between the United States and China. Whether this tack was a function of asymmetry in the size of the two nuclear arsenals remains uncertain. China's nuclear arsenal is significantly smaller than that of the United States, but the *NPR* did acknowledge that China lacks transparency regarding its nuclear programs and is undertaking a wholesale modernization, both in quality and quantity, of its nuclear weapons arsenal. The policy document points out that China's future strategic intentions were unclear regarding both the strategy and doctrine that guide its nuclear deterrent force, as well as the eventual size and scope of those forces. The *NPR* addressed the interdependence between the United States and China, "their shared responsibilities for addressing global security threats," and the need to promote strategic stability with China without ever defining the necessary ingredients for strategic stability or how it can be realized.[32]

China maintains a "no-first-use" policy for its nuclear weapons. That is, the country bases its deterrence on the ability to have a secure second-strike capability—a policy consistently in effect since China acquired nuclear weapons in 1964.[33] Although US policy makers debate the veracity of China's no-first-use pledge, that nation's small nuclear force supports a counterstrike capability.[34] However, the size and capability of that force are changing to meet China's security needs. Further, its no-first-use promise appears under debate in the People's Liberation Army (PLA). According to Maj Gen Yao Yunzhu, "Speculations on a possible change to the [no-first-use] policy have not been conjured up without reason."[35]

Why the potential change in China's nuclear posture and doctrine? According to Chinese military writing, the United States is the main nuclear adversary that China must account for, and "China views advances in . . . [US] ISR [intelligence, surveillance, and reconnaissance], conventional precision strike, and missile defense capabilities as potential threats to the credibility of its nuclear deterrent."[36] It is not the United States' advanced and superior nuclear capabilities that China perceives as undermining its nuclear deterrent but US advances in conventional capabilities.

How then did China react to the *NPR*'s call to reduce US reliance on nuclear weapons and invest in conventional capabilities to bridge that gap in America's security needs? Chinese civilian and military strategists have regularly and consis-

tently communicated their concern about a US conventional attack negating China's strategic deterrent prior to the US release of the *NPR* in 2010.[37] After publication of that document, Chinese analysts suggested that the US decision to invest in conventional capabilities such as CPGS was part of the United States' desire to seek "absolute security" and maintain its military supremacy. Chinese analysts fear that these advanced conventional capabilities designed by the United States to meet its nuclear deterrence needs are not constrained by the "nuclear taboo" and, in fact, are more usable.[38]

The Chinese believe that the very usability of advanced conventional weapons designed to perform a deterrence role actually undermines nuclear deterrence and causes other nations to rely more on their nuclear weapons arsenals because they cannot compete with the United States conventionally. Chinese analysts also fear a global conventional-weapons arms race, and some analysts warn that "a world free of nuclear weapons may open the door to the resumption of a large-scale conventional war."[39]

The most worrisome development from China comes from *The Science of Military Strategy* (December 2013), published to inform Chinese military professionals of how the "People's Liberation Army (PLA) perceives military development in China and around the world" and to offer a framework for the PLA to address them.[40] In that publication, the authors outline China's concern that its limited nuclear force is vulnerable to a first strike that would negate any ability to execute a retaliatory strike. To address this issue, the authors suggest that China may decide to launch on warning of an impending nuclear attack.[41] Such a decision increases the possibility of an accidental nuclear launch, given the difficulties in characterizing the type of incoming attack or the dangers of a malfunction in the early warning system.

Finally, the *NPR* repeatedly calls for the need to promote strategic stability with China. However, although that concept has been used in the context of nuclear relations for decades, it has no common, universally accepted definition.[42] Further, it also means that China's concept of what constitutes strategic stability may be different than that of the United States, possibly leading to a misunderstanding. Chinese scholars have recognized this disconnect, noting that US "experts have not given serious consideration to what the true meaning of strategic stability is, and have not adequately prepared to achieve strategic stability with China."[43]

Although it is not the only component of strategic stability, the Chinese perceive changes in the US nuclear posture as a threat to that stability.[44] Specifically, Chinese analysts have repeatedly insisted that US advanced conventional capabilities, including CPGS coupled with ballistic missile defense, represent a direct threat to China's secure second-strike capabilities. Therefore, Chinese analysts perceive a major contradiction in the *NPR*. "Advocacy for military capabilities that are seen to be detrimental to strategic stability in the same document that promotes strategic stability ultimately represents a circular logic" that if not addressed will make it difficult for China to participate in talks meant to promote strategic stability.[45]

### *Implications for Nuclear Deterrence*

A gulf exists between how the United States and Russia/China view the value of nuclear weapons. These adversarial perceptions are well documented, predating the development and release of the *NPR*, but were not taken into account during drafting of the new policy. The US decision to rely less on nuclear weapons to meet its national security needs, instead bridging the gap with advanced conventional capabilities, did not have the desired effect on our adversaries. Instead of inspiring confidence, it reinforced some of their worst fears.

The *NPR* overstated the improvement in US-Russia relations, and the US declaration that Russia was not an enemy did not consider how Russia viewed the relationship. Failure to take into account that country's deep-seated suspicion of the United States invalidated the *NPR*'s assumption that improved ties would allow the United States to rely less on nuclear weapons. Further, US policy and Russian policy do not agree on the usability of nuclear weapons. The US desire to decrease the role of nuclear weapons and compensate with conventional weapons suggests that US policy makers do not feel that nuclear weapons are usable. However, this perception contrasts with Russia's nuclear doctrine and statements, which have been consistent for well over a decade, that these weapons are quite usable. These differences are further emphasized as the United States debates unilateral reduction in nuclear capabilities while Russia violates a landmark arms-control treaty to increase the types and capabilities of its nuclear arsenal to gain a strategic advantage.[46] This situation creates a dangerous divide that has the potential for miscalculation and deterrence failure.

Both Russia and China are concerned with US use of advanced conventional capabilities in a strategic manner to negate their nuclear deterrent. According to the *NPR*, the United States has the strongest conventional capabilities in the world and an alliance system that further augments those capabilities. America has also demonstrated its willingness to use conventional power repeatedly over the last 25 years. The very usability of conventional precision-strike weapons capable of creating effects once reserved only for nuclear forces undermines deterrence by creating or reinforcing perceptions in our adversaries that their nuclear forces are vulnerable and that the United States may have an incentive to strike them. Both China and Russia are reevaluating their nuclear doctrines and relying more on nuclear weapons to counter this perceived threat.

## Conclusion

From nuclear weapons' pinnacle of importance at the end of the Cold War to today, the United States has steadily decreased the attention paid to its nuclear arsenal and strategy, but nuclear deterrence has not decreased in its overall importance. It is clear that our adversaries place much more value in their nuclear arsenals than does the United States, precisely to deter America's unmatched conventional power. The US decision to rely more on conventional weapons to achieve nuclear deterrence has created dangerous potential for miscalculation in its deterrent relationships with Russia and China.

The United States has fallen into a "mirror imaging" trap by assuming that other nations place the same low value on nuclear weapons that it does and that they have the same priority of reaching "Global Zero." The Obama administration has even gone so far as to recommend unilateral nuclear reductions, which were made outside arms-control negotiations with Russia.[47] Part of this policy is that other nuclear-armed nations will follow the US example and choose to reduce the size of their nuclear arsenal. This assumption does not take into account how our opponents interpret their security environment and the role that nuclear weapons play in safeguarding their interests.

Relations with other nuclear powers have been fairly cooperative and benign since the end of the Cold War. Crises that arose were managed, and peaceful solutions have been negotiated, contributing to the mistaken belief that nuclear weapons are no longer relevant. However, could it be that those weapons encourage leaders to be benign and cooperative?[48] In 1946 J. Robert Oppenheimer reflected that "it did not take atomic weapons to make man want peace. But the atomic bomb was the turn of the screw. It has made the prospect of war unendurable."[49] That is, far from being unusable, nuclear weapons are used every day to encourage compromise in international relations because failure to compromise may lead to the unthinkable.

In drafting the *NPR*, the US government failed to consider the perceptions of our adversaries or to tailor strategy to the unique threat that each poses. As we have pointed out, deterrence is a psychological function in the mind of the adversary. Failure to acknowledge and account for how our enemies view their security environment, their relationship with the United States, their unique history and culture, or the value they place on nuclear weapons to meet their security needs has made our deterrence relationships potentially less stable. Increasing our emphasis on conventional weapons that adversaries view as more usable and a threat to their nuclear arsenals has caused them to feel insecure. To counter this trend, they have modernized and increased the size of their arsenals and rely more on nuclear weapons to meet their security needs.

Nuclear deterrence has always been a risky proposition, and the fact that it has not failed in the past 70 years may have as much to do with our deterrence strategy as plain luck. But as risky as relying on nuclear deterrence is, it is still the "least bad" option and has not lost its relevance. Therefore, it is important that we strive to understand our adversaries as we develop and implement our nuclear-deterrent strategies so that we do not undermine its effectiveness. Nuclear deterrence may be much more fragile than any of us realize. It is imperative that we do not take the "nuclear taboo" for granted by assuming that our adversaries place the same value on the relevance of nuclear weapons that we do.

Finally, in 1960 Herman Kahn came under heavy criticism for his book *On Thermonuclear War* (Princeton University Press, 1960) in which he outlined the possibility of enduring a nuclear war, reducing its likelihood, and coping with the consequences. In response to the criticism, he wrote, "In our times, thermonuclear war may seem unthinkable, immoral, insane, hideous, or highly unlikely, but it is not impossible."[50] Today, because it is still not impossible, we must continue to think and learn about the complexities of these issues as the strategic environment

changes, and we must make the effort to understand our adversaries in order to maintain and nurture nuclear deterrence today and in the future. ✪

## Notes

1. "Remarks by President Barack Obama, Hradcany Square, Prague, Czech Republic" (Washington, DC: White House, Office of the Press Secretary, 5 April 2009), http://www.whitehouse.gov/the_press_office/Remarks-By-President-Barack-Obama-In-Prague-As-Delivered.
2. Department of Defense, *Nuclear Posture Review Report* (Washington, DC: Department of Defense, April 2010), http://www.defense.gov/npr/docs/2010%20Nuclear%20Posture%20Review%20Report.pdf.
3. Keith B. Payne, *The Great American Gamble: Deterrence Theory and Practice from the Cold War to the Twenty-First Century* (Fairfax, VA: National Institute Press, 2008), 20.
4. Bernard Brodie, ed., *The Absolute Weapon: Atomic Power and World Order* (New York: Harcourt, Brace, 1946), 76.
5. Department of Defense, *Deterrence Operations Joint Operating Concept*, version 2.0 (Washington, DC: Department of Defense, December 2006), 3, http://www.dtic.mil/doctrine/concepts/joint_concepts/joc_deterrence.pdf.
6. Gen Kevin Chilton and Greg Weaver, "Waging Deterrence in the Twenty-First Century," *Strategic Studies Quarterly* 3, no. 1 (Spring 2009): 34.
7. Department of Defense, *Deterrence Operations Joint Operating Concept*, 3.
8. M. Elaine Bunn, "Can Deterrence Be Tailored?," *Strategic Forum*, no. 225 (January 2007): 3.
9. Keith B. Payne, "Maintaining Flexible and Resilient Capabilities for Nuclear Deterrence," *Strategic Studies Quarterly* 5, no. 2 (Summer 2011): 14.
10. Department of Defense, *Nuclear Posture Review Report*, 7.
11. "Remarks by President Barack Obama."
12. Department of Defense, *Nuclear Posture Review Report*, iv.
13. Ibid.
14. Ibid., 17.
15. Ibid., 45.
16. Kevin Kallmyer, *Assessing Implementation of the 2010 Nuclear Posture Review* (Washington, DC: Center for Strategic and International Studies, June 2011), 16, http://csis.org/files/publication/110826_NPR_Imp.pdf.
17. Amy F. Woolf, *Conventional Prompt Global Strike and Long-Range Ballistic Missiles: Background and Issues*, CRS Report R41464 (Washington, DC: Congressional Research Service, 6 February 2015), 1, https://fas.org/sgp/crs/nuke/R41464.pdf.
18. Global Zero, *Global Zero U.S. Nuclear Policy Commission Report: Modernizing U.S. Nuclear Strategy, Force Structure and Posture* (Paris: Global Zero, May 2012), 2, 11, http://www.globalzero.org/files/gz_us_nuclear_policy_commission_report.pdf.
19. Ibid., 6.
20. Department of Defense, *Nuclear Posture Review Report*, 4, 15.
21. Ariel Cohen and Helle C. Dale, "Russian Anti-Americanism: A Priority Target for U.S. Public Diplomacy," Heritage Foundation, 24 February 2010, http://www.heritage.org/research/reports/2010/02/russian-anti-americanism-a-priority-target-for-us-public-diplomacy.
22. Jacob W. Kipp, "Russia's Nuclear Posture and the Threat That Dare Not Speak Its Name," in *Russian Nuclear Weapons: Past, Present, Future*, ed. Stephen J. Blank (Carlisle, PA: Strategic Studies Institute, November 2011), 468–69, http://www.strategicstudiesinstitute.army.mil/pdffiles/PUB1087.pdf.
23. Dale R. Herspring, "Russian Nuclear and Conventional Weapons: The Broken Relationship," in Blank, *Russian Nuclear Weapons*, 9.
24. Jonah Friedman, "Russia's Nuclear Forces and Doctrine," Center for Strategic and International Studies, 19 July 2011, http://csis.org/blog/russias-strategic-nuclear-forces-and-doctrine.

25. Dan Gouré, "How Barack Obama's Vision of a Nuclear-Free World Weakens America's Security: Russia, Deterrence, and Missile Defense," Heritage Foundation, 10 September 2010, http://www.heritage.org/research/lecture/russia-deterrence-and-missile-defense.

26. "Russia's New Military Doctrine Lists NATO, US as Major Foreign Threats," RT News, 26 December 2014, http://rt.com/news/217823-putin-russian-military-doctrine/.

27. Gouré, "Barack Obama's Vision."

28. Michael R. Gordon, "U.S. Says Russia Tested Cruise Missile, Violating Treaty," *New York Times*, 28 July 2014, http://www.nytimes.com/2014/07/29/world/europe/us-says-russia-tested-cruise-missile-in-violation-of-treaty.html?_r=0.

29. "Statement by the Secretary General on the INF Treaty," North Atlantic Treaty Organization, 30 July 2014, http://www.nato.int/cps/en/natohq/news_111823.htm.

30. Greg Botelho and Laura Smith-Spark, "Putin: You Better Not Come After a Nuclear-Armed Russia," *CNN*, 30 August 2014, http://www.cnn.com/2014/08/29/world/europe/ukraine-crisis/index.html?hpt=hp_t1.

31. Sergei L. Loiko, "Russia Says It Has a Right to Put Nuclear Weapons in Crimea," *Los Angeles Times*, 15 December 2014, http://touch.latimes.com/#section/-1/article/p2p-82295028/.

32. Department of Defense, *Nuclear Posture Review Report*, v, 4–7.

33. Sr Col Yao Yunzhu, "China's Perspective on Nuclear Deterrence," *Air and Space Power Journal* 24, no. 1 (Spring 2010): 27–30, http://www.airpower.maxwell.af.mil/airchronicles/apj/apj10/spr10/aspj_en_2010_1.pdf.

34. Stephanie Spies, "China's Nuclear Policy: (No) First Use?," Center for Strategic and International Studies, 20 October 2011, http://csis.org/blog/chinas-nuclear-policy-no-first-use.

35. James M. Acton, "Debating China's No-First Use Commitment: James Acton Responds," Carnegie Endowment for International Peace, 22 April 2013, http://carnegieendowment.org/2013/04/22/debating-china-s-no-first-use-commitment-james-acton-responds.

36. Michael S. Chase et al., *China's Incomplete Military Transformation: Assessing the Weaknesses of the People's Liberation Army (PLA)* (Santa Monica, CA: RAND Corporation, February 2015), 123, http://www.rand.org/content/dam/rand/pubs/research_reports/RR800/RR893/RAND_RR893.pdf.

37. Larry M. Wortzel, *China's Nuclear Forces: Operations, Training, Doctrine, Command, Control and Campaign Planning* (Carlisle, PA: Strategic Studies Institute, May 2007), viii.

38. Lora Saalman, *China & the U.S. Nuclear Posture Review* (Beijing: Carnegie-Tsinghua Center for Global Policy, February 2011), 22.

39. Ibid.

40. Gregory Kulacki, *The Chinese Military Updates China's Nuclear Strategy* (Cambridge, MA: Union of Concerned Scientists, March 2015), 1, http://www.ucsusa.org/sites/default/files/attach/2015/03/chinese-nuclear-strategy-full-report.pdf.

41. Ibid., 4.

42. For a detailed discussion on strategic stability, see Elbridge A. Colby and Michael S. Gerson, eds., *Strategic Stability: Contending Interpretations* (Carlisle Barracks, PA: US Army War College Press, February 2013).

43. Saalman, *China & the U.S. Nuclear Posture Review*, 27.

44. Thomas Fingar and Fan Jishe, "Ties That Bind: Strategic Stability in the U.S.-China Relationship," *Washington Quarterly* 36, no. 4 (Fall 2013): 130, http://fsi.stanford.edu/sites/default/files/TWQ_13Winter_Fingar-Jishe.pdf.

45. Saalman, *China & the U.S. Nuclear Posture Review*, 26.

46. For a detailed analysis of Russian treaty violations, see Dr. Mark B. Schneider, *Confirmation of Russian Violation and Circumvention of the INF Treaty*, National Institute Information Series no. 360 (Fairfax, VA: National Institute for Public Policy, February 2014), http://www.nipp.org/wp-content/uploads/2014/11/Confirmation-of-Russian-Violations-of-the-INF-Treaty8.pdf.

47. Baker Spring, "Disarm Now, Ask Questions Later: Obama's Nuclear Weapons Policy," Heritage Foundation, 12 July 2013, http://www.heritage.org/research/reports/2013/07/disarm-now-ask-questions-later-obamas-nuclear-weapons-policy.

48. Patrick M. Morgan, "The State of Deterrence in International Politics Today," *Contemporary Security Policy* 33, no. 1 (April 2012): 85–107.

49. Jonathan Stevenson, *Thinking beyond the Unthinkable: Harnessing Doom from the Cold War to the Age of Terror* (New York: Penguin Group, 2008), 6.
50. Herman Kahn, *Thinking about the Unthinkable* (New York: Horizon Press, 1962), 21.

**Jennifer Bradley**

Ms. Bradley (BS, Eastern Oregon University; MS, Missouri State University) joined the National Institute for Public Policy as an analyst in 2007. She currently provides on-site support at United States Strategic Command in the Plans and Policy Directorate as part of the Deterrence Analysis Plans Support group in Omaha, Nebraska. She is responsible for conducting adversary-specific deterrence analysis to support strategy and plan development. Prior to joining the National Institute, Ms. Bradley worked as a market research associate for Lockheed Martin Missile Defense Systems.

**Let us know what you think! Leave a comment!**



**http://www.airpower.au.af.mil**

# Deterrence in Professional Military Education

Paul I. Bernstein*

It is now commonplace to hear or read about the urgent need for fresh thinking on deterrence and for rebuilding the intellectual and analytic enterprise that produced concepts which guided the West through the existential dangers of the Cold War. We hear this admonition from senior civilian and military leaders, subject-matter experts, and commentators—and we hear it with good reason. No one paying attention would disagree that we face deterrence challenges that are different and in some ways more complex than those we encountered in the Cold War or even the first phase of the post–Cold War period. In the emerging security environment, we confront a broader array of antagonists armed with a wider range of conventional and unconventional capabilities; consequently, we must consider the possibility of crises and conflicts with which we have little experience and that could unfold in ways difficult to predict and rehearse. Questions that preoccupied us during the Cold War—how to promote stability, deter nuclear attacks, and manage the risks of escalation—are still with us, although in very new contexts that now encompass novel factors such as cyber weapons and "hybrid warfare."

The institutional response to this set of challenges in the Department of Defense (DOD) is a work in progress in key areas such as concept development, planning, capabilities, leader awareness, and education. We have made progress in acquiring a stronger understanding of adversary doctrine and developing deterrence concepts that can guide operational planning; moreover, complex escalation scenarios increasingly are the focus of tabletops and war games in the strategic forces community. Nevertheless, significant deficits exist at the regional level, where geographical combatant commands still struggle to understand how conventional conflicts could escalate to the nuclear level and what that would mean for US campaign plans. Important emerging concepts for regional deterrence and defense quite rightly address such issues as conventional power projection in contested operational envi-

*The views expressed in this article are the author's and not necessarily those of either National Defense University or the Department of Defense. The author wishes to acknowledge the contribution of his colleagues Charles Lutes and Robert Peters.

ronments, but they have yet to wrestle adequately with the ways in which these concepts could shape—or be shaped by—regional nuclear dynamics. Slowly, awareness of these considerations is growing in the necessary communities, as is the recognition that any assessment of future capabilities to underwrite deterrence and defense must account for those that can deliver advantages not only in power projection but in all aspects of strategic warfare.

Professional military education (PME), however, lags in the attention it gives to contemporary deterrence problems. One reason for this is that senior-level guidance to the PME community does not emphasize or even call out these issues. The Officer Professional Military Education Policy (OPMEP), issued by the Joint Staff, provides a comprehensive framework for officer education across the strategic, operational, and tactical domains but curiously fails to highlight the need to teach deterrence in the PME classroom.[1] One could argue that deterrence is an implied topic nested under any number of specific learning objectives defined in the policy. One could argue with equal validity, though, that the absence of an explicit emphasis on deterrence generally and regional nuclear deterrence in particular represents a significant gap that negatively affects the content of education. Indeed, my colleagues and I have been told by a number of current and retired senior military leaders that they had not been adequately prepared for the deterrence and escalation issues they encountered in regional command posts.

Senior leadership is providing, at best, only a weak "demand signal" that would give PME schools the impetus to adapt their core curricula to include vital content on deterrence, escalation, cross-domain conflict, and crisis management under the nuclear shadow. These programs of instruction generally are fully committed to existing OPMEP requirements, and efforts to introduce new content often meet resistance from administrators and faculty. To the author's knowledge, there has been no recent formal review of the PME system to assess how senior and intermediate joint and service schools address deterrence. Certainly, deterrence is not completely neglected in core curricula, yet substantial engagement in the PME community indicates that across the system as a whole, deterrence is treated neither in depth nor systematically as a major learning objective. Although individual academic or research faculty are free to offer electives, even first-rate elective classes—and good examples of them exist—reach only a relatively small number of students.

Some institutions are further along than others. For example, the Air Force has established critical thinking on deterrence and assurance as a pillar of the "flight plan" for its nuclear enterprise. The goal is to sustain a formal program that will develop a cadre of Airmen with comprehensive knowledge of strategic deterrence and assurance theory, practice, and experience. Air University offers supporting courses such as a two-term elective consisting of intensive seminar discussion, field study, and independent research on nuclear strategy, technology, and policy. A professional continuing education program provides classroom instruction to individuals working in the nuclear enterprise, from junior officers to senior military and civilian leaders. At the Naval War College, the competitive Mahan Scholars program gives students an enhanced learning experience in strategic deterrence and escalation in the context of US national strategy and the conventional, nuclear,

cyber, and space domains. It includes 90 hours of classroom engagement and a major research product.

Programs like these are vital to the overall goal of ensuring that PME treats deterrence in a serious and systematic way and should be encouraged. However, they are only one part of the solution. A comprehensive approach should include the following.

- *Revise the Guidance*. The next review and revision of the OPMEP should state an explicit requirement with respect to deterrence. Doing so will send a critical demand signal to the PME community that leadership wishes to see meaningful content on these issues. Realistically, though, the opportunity to take this step likely will not occur for a few years as a revised OPMEP was issued in May 2015. It is important that a range of other actions be pursued until the next revision process is undertaken. As an example, contemporary deterrence issues should be designated a Special Area of Emphasis in PME for the forthcoming academic year and beyond.[2]

- *Objectively Assess Gaps*. Leadership should commission a formal, comprehensive review of how deterrence is addressed in core curricula at joint and service intermediate and senior schools as well as general officer / flag officer activities such as Pinnacle and Capstone. This review should also consider looking at primary and precommissioning venues, such as the service academies. An existing senior advisory body or an ad hoc blue ribbon–style panel should conduct this review, and a senior leader such as the vice-chairman of the Joint Chiefs of Staff should commission it. Alternatively, the commander of US Strategic Command (STRATCOM) should use his existing authorities to commission such a study by an appropriate body. Work in this area by the Commander's Strategic Advisory Group may provide a useful starting point. Any review should consider the idea of naming a DOD organizational focal point for deterrence education.

- *Develop a Plan and Supporting Resources*. STRATCOM should take the lead in preparing a plan to strengthen the deterrence content of PME and in developing instructional materials that would support execution. The plan should allow for flexible application by faculties and be modular in nature so that instructors have a menu of resources to consider. This suggests making available model programs of instruction or lesson plans that could be adopted (and adapted as needed) by faculty. One type of curriculum could be tailored for integration into the core, another could support electives, and yet another could focus on candidate tabletop exercises. All could be supplemented by reading lists and other resources for faculty and students, such as a "deterrence primer" that captures essential readings, concepts, and analytic tools. It may also make sense to create an informal reachback resource for faculty who seek advice and assistance.

- *Advocate for Deterrence Education*. The STRATCOM commander and other senior leaders should be forceful advocates for deterrence-related education, both publicly and in the councils of the DOD. Speeches, public presentations, and testimony by these leaders should emphasize the importance of addressing

deterrence in formal and informal classrooms. Any revision or update to the Deterrence Operations Joint Operating Concept should note the importance of teaching deterrence in PME.

- *Nurture Talent.* An effort should be made to identify future leaders at PME schools who are interested in deterrence and related issues. These students should receive opportunities to devote a portion of their work to these topics. At National Defense University (NDU), so-called scholars programs engage students who have expressed a desire to pursue issues of interest to US Pacific and European Commands. These students commit to conduct research and take electives on these topics and are provided research resources and an opportunity to present their findings to leadership. A similar NDU program in collaboration with STRATCOM to focus on deterrence and related issues has been proposed and is under active consideration.
- *Gather the Community.* An annual deterrence education workshop would offer a regular opportunity for PME faculty to share experiences and best practices. Such a workshop could include both formal and informal educators from the civilian academic, think tank, and nongovernmental organization communities. A deterrence education workshop could occur on the margins of STRATCOM's annual deterrence symposium, or as an alternative to a formal workshop, STRATCOM could consider making a discussion of deterrence and PME a permanent feature of that symposium.
- *Don't Forget Continuing Education and Professional Development.* Formal PME is only part of the equation. Equally important are joint and service vehicles for continuing education and professional development that need not be associated with degree-granting PME schools. A pressing need exists to give junior-, mid-, and senior-level officers and civilians opportunities to learn, stay current, and engage with their leadership. Further, this is one way of filling gaps in the formal PME system. The aforementioned Air Force program for professional continuing education on nuclear deterrence is a useful model—one that should be followed in the joint community, which already offers courses for general and flag officers in cyberspace, information, and special operations. Even less formal professional development opportunities are important as well. Many of these exist across the DOD, but it is not clear how well such disparate activities address deterrence. A good model for working-level professionals is the Strategic Policy Overview program managed by the Air Force Institute for National Security Studies for the Air Staff.
- *Encourage and Leverage PME Research.* At all PME schools, but especially those with strong research enterprises, research faculty and subject-matter experts should be encouraged to address deterrence in their work, which can be a vital source of conceptual and practical insight to decision makers. PME institutions should also actively promote the timely integration of faculty research on deterrence into the classroom. Doing so may be the norm at some schools, but it should become a routine and deliberate practice wherever possible. Analytic activities performed outside the PME community also should

migrate to the classroom. This could include results of senior-level war games and the work of STRATCOM's Strategic Deterrence Assessment Laboratory, to cite two possibilities.

Recently, senior leaders have called for greater institutional rigor in PME, noting that education is a key line of effort to offset competitors' military capabilities and that our PME system is a strategic asset and an asymmetric advantage. To an educator and practitioner in the deterrence field, it seems self-evident that pressing this advantage must entail active engagement on the critical issues affecting deterrence and regional conflict. A "real-time" indicator of whether the DOD shares this view may come soon, as the military departments, in coordination with the Joint Chiefs of Staff and the Office of the Secretary of Defense, undertake a study to identify policy and resource approaches to ensure that PME graduates are properly prepared to understand and contend with the doctrine and capabilities of increasingly sophisticated adversaries. Findings of this study were to be briefed to the deputy secretary of defense and vice-chairman of the Joint Chiefs of Staff in late July 2015. ✪

## Notes

1. Chairman of the Joint Chiefs of Staff Instruction 1800.01E, *Officer Professional Military Education Policy (OPMEP)*, 29 May 2015, http://www.dtic.mil/cjcs_directives/.
2. For reference, the 2014 PME Special Areas of Emphasis were Profession of Arms; Women, Peace and Security; Security Force Assistance; and Building Partnership Capacity.

**Paul I. Bernstein**

Mr. Bernstein (BA, Binghamton University; MA, Columbia University) is a Senior Research Fellow at the Center for the Study of Weapons of Mass Destruction at National Defense University in Washington, DC, and a member of the university's research faculty. He is engaged in a range of policy support, research, and professional military education (PME) activities related to weapons of mass destruction (WMD), nuclear policy, deterrence, arms control, and regional security. Mr. Bernstein has been an adviser to the Department of Defense Threat Reduction Advisory Committee and currently advises the Defense Science Board Task Force on Deterring, Preventing, and Responding to the Threat or Use of WMD. He is a regular guest instructor at senior war colleges and other PME venues and has developed multiple curricula on nuclear and WMD topics. Most recently he has authored two chapters in the edited volume *On Limited Nuclear War in the 21st Century* (Stanford Security Studies, 2014) and has written the following WMD Center publications: *Proliferation Risks of Civil Nuclear Power Programs* (with Nima Gerami), *The Origins of Nunn-Lugar and Cooperative Threat Reduction* (with Jason D. Wood), *Countering Weapons of Mass Destruction: Looking Back, Looking Ahead* (with John P. Caves Jr. and W. Seth Carus), and *The Future Nuclear Landscape* (with John P. Caves Jr. and John F. Reichart).

**Beale Air Force Base during the Cold War**, Images of America, by James B. Quest. Arcadia Publishing (http://arcadiapublishing.com), 420 Wando Park Boulevard, Mount Pleasant, South Carolina 29464, 2014, 128 pages, $21.99 (softcover), ISBN 978-1-4671-3081-3.

James Quest's *Beale Air Force Base during the Cold War*, part of Arcadia Publishing's Images of America series, combines plenty of vintage photographs with a minimum of text to explain their significance. The author does an adequate, though unbalanced, job of capturing the Cold War sights and flavor of Beale AFB, located in California. The introduction relates the Army's use of the base during World War II as Camp Beale and the early Air Force's utilization of it as a bombing and gunnery range after the war.

Chapter 1, "SCARWAF," discusses the Special Category Army Reassigned with the Air Force units there, with photos of these Army engineering forces honing their skills as they developed the base. Focused on the building of the flight line, chapter 2 offers some delightful photographs of the runways and control tower under construction. Chapters 1 and 2 depart somewhat from the book's title insofar as the SCARWAF was a renamed program that started during World War II and ended in the mid-1950s; it was not created for the Cold War. The building of flight lines occurred before, during, and after that era.

Chapter 3, "Titan I Missile Sites," examines Beale's brief tenure as host to intercontinental ballistic missiles and briefly introduces the Titan I and the three local missile sites. The chapter includes a nice selection of photographs of the locations under construction and those in use. Also well documented is a major explosion at one of the sites.

Chapter 4, "KC-135 Stratotanker," and chapter 5, "B-52 Stratofortress," concentrate on the Strategic Air Command tanker and bomber forces, respectively, and their basing at Beale, concisely summarizing the units involved. They include numerous photographs of the KC-135Q (specially adapted to refuel the SR-71 aircraft) but only one photo of the KC-135A. Quest also offers images of two of the three models of B-52 aircraft (E and G) stationed at Beale, omitting the B-52D. Aircraft buffs will be pleased that in most cases, he provides aircraft serial numbers in the captions. Readers will also find photos of the AGM-28 Hound Dog missiles and support facilities as well as a brief discussion of the filming of the movie *A Gathering of Eagles* at Beale, including mention of the swimming pool and roller skating rink donated to the base by Universal Pictures.

In "Scramble!," the sixth chapter, the author addresses the matter of bomber and tanker crews pulling alert duty. Photographs depict the "mole hole" alert facility and crews responding to their aircraft. Chapter 7, "Vietnam War," covers the deployment of assigned B-52 and KC-135 aircraft, along with their personnel, to Southeast Asia. In a nice touch, Quest includes photos and information about the crew members involved in two B-52 aircraft losses and discusses their fates.

Chapters 8 and 9, "SR-71 Blackbird/Habu," and "U-2 Dragon Lady," respectively, highlight these unique aircraft, which served at Beale. Readers learn about aircraft operations and the purpose-built SR-71 hangars but do not see those for the U-2. Quest offers a photograph of a chase car—a fascinating detail of the U-2 program—and includes, without explanation, images of T-38 trainer aircraft.

In "Desert Shield and Desert Storm," the subject of chapter 10, the author examines the base's contributions to those operations. Arguably, a dozen pages of photographs taken in Southwest Asia are out of place here but may be appreciated by Beale veterans of that era. Chapter 11, "The End of an Era," closes out the book with photographs of KC-135Q aircraft

departing Beale for the final time. Oddly, one of the captions for a 1994 photo of a KC-135Q observes, "That final symbol of Strategic Air Command at Beale AFB slowly climbed into the heavens" (p. 127) even though the U-2 continued to serve at Beale for many years.

Minor flaws include a photograph taken at "Alicia Airport (present-day Yuba County Airport)" rather than at Beale (p. 10). On page 61, wheel chocks are referred to as wheel "chalks." Moreover, a KC-10 is misidentified as a KC-135Q (p. 119). More seriously, the book fails to mention two Cold War facilities: the Semi-Automatic Ground Environment (SAGE) Direction Center (DC-18) and the PAVE PAWS (phased array warning system) radar complex, both of which proved significant to our defense during the Cold War and remain hard-to-miss landmarks on Beale. The SAGE Direction Center was operational as such only from 1959 to 1963, but the building survives and has been used for several purposes since that time. The PAVE PAWS complex, employed only during the last decade of the Cold War, continues to operate. This reviewer would have preferred less emphasis on chapters 1, 2, 10, and 11 in favor of including these systems in the book. As it stands, parts of the text have only marginal Cold War interest.

I do not recommend *Beale Air Force Base during the Cold War* for the Air Force audience at large. Students of the Cold War who are familiar with the base will find good supplemental information here on the missile and aircraft missions. Readers new to Cold War history, however, will discover that this book presents a limited view of the base's role during that time.

**Scott D. Murdock**
*Buckley AFB, Colorado*

**Asian Maritime Strategies: Navigating Troubled Waters** by Bernard D. Cole. Naval Institute Press (http://www.usni.org/navalinstitutepress), 291 Wood Road, Annapolis, Maryland 21402, 2013, 320 pages, $34.95 (hardcover), ISBN 9781591141624.

In *Asian Maritime Strategies*, Bernard Cole offers his readers an expansive, albeit worn, rendition of "trouble is brewing in Asia." Although his monograph is useful to individuals unfamiliar with the changing scene in the Pacific, it reveals little to those with a decent understanding of the growing tensions there. Regrettably, one finds no new insights in this study. He does, however, provide some handy facts concerning the United Nations Convention on the Law of the Sea, which has become the axis around which disputes revolve but, interestingly, has also added octane to what had previously been less combustible sovereignty issues.

The author charts a predictable path as he analyzes the Pacific "landscape" before delving into specific maritime strategies of the United States, Japan, China, and India, among others. He addresses the much-trumpeted American "pivot" to Asia, pointing out that it has been heavy on rhetoric and less so in any tangible sense, to date. As such, many states, most notably Japan, have begun hedging their bets by expanding cooperation with other Asian players to offset robust Chinese maritime defense spending.

The utility of the work can be boiled down to the intended audience. As an introductory volume, it does a relatively good job of casing the region and the inherent challenges. If, however, the audience is the academic community—specifically, those fully conversant about the area—then this book falls short because it does not push the boundaries; rather, it stays neatly within expected parameters of a prefatory exposition.

A more fruitful approach might have involved examining whether China can stay true to the maxim proffered by its most clairvoyant leader Deng Xiaoping, who wisely advised his countrymen to "hide your strength and bide your time." Undeniably, China's continued rise

to prominence depends on a tranquil environment in Asia. Yet, Beijing increasingly appears unwilling (or unable) to manage the contradictory forces of pronounced nationalism and dynamic globalism. Domestic forces may significantly derail China's future progress just as Beijing appears to be in the initial stages of eclipsing Washington's power in the region. Ironically, domestic frustrations, stirred in the past to deflect criticism of central government control and authority, may ultimately prove the downfall of the stellar rise orchestrated by Communist leaders. Logically, it is difficult to fathom why China would risk greatly heightened confrontation within or outside Asia. Then, again, logic takes one only so far. As is often the case, rational approaches can be short-circuited by primordial influences like fear, self-interest, and honor. Obviously, America is not immune to these influences. It would have been interesting if Cole had delved into how each side could potentially agitate the relatively placid waters by assuming too much, or too little, about the other.

*Asian Maritime Strategies* updates the ongoing regional disputes and concerns, adding to the glut of coverage. However, it misses the mark in terms of addressing the most crucial questions associated with an impending geopolitical shift of this magnitude.

**Lt Col John H. Modinger, PhD, USAF**
*USAF Academy*

**Revolutionary Atmosphere**, NASA SP 2010-4319, by Robert S. Arrighi. National Aeronautics and Space Administration, History Division, Public Communications Office (http://www.nasa.gov/), Suite 2R40, Washington, DC 20546, 2010, 412 pages, $35.96 (hardcover), ISBN 978-0-16-085641-9. Available free from http://history.nasa.gov/SP-4319.pdf.

On the surface, *Revolutionary Atmosphere* is the history of the Altitude Wind Tunnel (AWT), built during World War II as the centerpiece of the National Advisory Committee for Aeronautics' (NACA) new Aircraft Engine Research Laboratory (later the Lewis Research Center and currently the Glenn Research Center), and then modified as a space vacuum chamber to test components for the US space program. In the process, this book also illustrates the rapid postwar advance of US air and space technology, evolution of the NACA into the National Aeronautics and Space Administration (NASA), and the rise of the US space program.

The AWT was conceived after NACA and Army Air Corps experts toured German aeronautics research facilities in the late 1930s. With enthusiastic backing from Gen Henry "Hap" Arnold, NACA leadership successfully lobbied for a wholesale expansion of the committee's test capabilities, including an engine research complex in the aircraft-component manufacturing center of Cleveland, Ohio. The AWT was originally designed to meet the challenge of ground-testing large piston engines under realistic high-altitude conditions.

Completed in 1943, the AWT served its original purpose for only a few years, most notably supporting modifications to the B-29's fire-prone R-3350 engine. Very rapidly, though, work shifted to research and development of jet engines, starting with the first British Whittle engine installed in the Bell P-59. The AWT tested nearly every jet engine developed in the United States up through 1957 and conducted pioneering research on afterburners and variable-geometry nozzles.

In 1959 the AWT was decommissioned as a wind tunnel and modified to house a multiaxis control trainer for the Mercury program. Two years later, it again underwent modifications to test rocket upper stages and spacecraft payloads in very high altitude and vacuum environments. Renamed the Space Power Chambers (SPC) in this role, the facility supported

development, build out, and launch of space research payloads powered by the Atlas-Centaur until 1975. Rendered obsolete by larger and more modern NASA and Air Force facilities, the SPC was mothballed afterwards and eventually torn down in 2007.

Author Robert Arrighi, a contract historian at NASA Glenn Research Center, has published extensively on the center's history and its facilities. Along with the book, he created a DVD chronicling the history of the AWT as well as an interactive web page and illustrated online tour aimed at educators (see http://awt.grc.nasa.gov/). Typical of most NASA history publications with which the reviewer is familiar, the book is written very matter of factly and heavily illustrated with black-and-white photographs drawn from NASA's archives. Unfortunately, as is also typical of most NASA histories, the photo reproduction is mediocre and doesn't do the originals justice, but the same photographs in better quality can be found on the AWT web page. The first chapter provides a brief description of the NACA's role in US aeronautics development in the 1920s and 1930s, together with an overview of how wind tunnels fit into aeronautical research—essential background for casual readers if they are to appreciate the rest of the book. Although not light reading, *Revolutionary Atmosphere* offers a unique peek into a dynamic and inspiring time in US aviation history.

**Col Jamie Sculerati, USAF, Retired**
*Land O' Lakes, Florida*

**War, Clausewitz, and the Trinity** by Thomas Waldman. Ashgate Publishing (http://www.ashgate.com), 110 Cherry Street, Suite 3-1, Burlington, Vermont 05401-3818, 2013, 203 pages, $109.95 (hardcover), ISBN 978-1-4094-5139-6.

*War, Clausewitz, and the Trinity* is a detailed analysis of Carl von Clausewitz's seminal book *On War* as well as selections from his other writings. The book's purpose is to offer readers a better understanding of Clausewitz and the context of his writing by building on previous secondary studies. Dr. Thomas Waldman, an Economic and Social Research Council Fellow at the University of York, interpreted Clausewitz's theory of war in relation to modern conflict for his doctoral thesis. His knowledge of Clausewitz's life and writings—together with numerous secondary sources on the subject, which he references throughout this book—is impressive.

Here, he focuses on "passion, chance and policy" (p. 2), the three central elements or "trinity" that comprise war according to Clausewitz. The trinity is represented in the physical world by a secondary trinity: the people, commander and army, and government. Dr. Waldman also discusses a tertiary level to the trinity, which is historical context. He emphasizes the importance of context because the face of war is constantly changing. The author points out the discrepancy between Clausewitz's continued popular status with military historians and the lack of in-depth study of his work, a situation that has led to general misunderstanding or misinterpretation of his ideas.

The book consists of eight chapters, including a discussion of the theoretical foundations of Clausewitz's ideology and the historical context of *On War* as well as separate chapters on each of the individual elements of war and one that discusses their interaction. To understand or appreciate the author's argument, the reader need not have read Clausewitz or be familiar with any of the secondary sources discussed. Waldman does an excellent job of providing background information and synopsizing main points from the works of other historians who have written on the same subject. Consequently, the book serves as a good starting point for further study into Clausewitz's ideology.

A first look at the size of *War, Clausewitz, and the Trinity* would suggest a quick or easy read, but the content sometimes requires rereading to appreciate the author's point. Overall, the text is well written and detailed, featuring a compelling thesis. The book has no major faults, but the nature of its subject matter makes it somewhat abstract at times. As long as Clausewitz is a focus of study by military historians, including members of the Air Force community, this book should remain relevant.

**Maj Michael D. Kennedy, USAF**
*Camp Walker, Republic of Korea*

**The Pentagon and the Presidency: Civil-Military Relations from FDR to George W. Bush** by Dale R. Herspring. University Press of Kansas (http://www.kansaspress.ku.edu), 2502 Westbrooke Circle, Lawrence, Kansas 66045-4444, 2005, 490 pages, $45.00 (hardcover), ISBN 978-0-7006-1355-7; 2006, 384 pages, $19.95 (softcover), ISBN 978-0-7006-1491-2.

Dale Herspring's *The Pentagon and the Presidency* includes 14 chapters, the first and last providing a comprehensive backdrop and conclusion, respectively. Initially, the author introduces a historical outline through a variety of scholars while offering a segue for considering other alternatives to addressing timeless questions and issues concerning the presidency and the Pentagon. Consequently, the final chapter allows readers to arrive at their own conclusions. Herspring offers the notion that while the presidency is colored with vibrant personalities, it can become an inanimate entity and function of the US government.

Throughout US history, presidents have taken office without having served in the military. Herein lies an important, understood expectation that they nevertheless not only support but also intimately understand military culture. Although the relationship between the commander in chief and military leadership is delicate, Herspring inserts another player—the US Congress. He deftly discusses the sometimes volatile intersection between the military and politics during wartime regarding strategic affairs as well as operational and tactical matters. Furthermore, familiar historical figures appear in this study, illuminated by the daily behind-the-scenes drama.

Each chapter offers a personal, animated view of each president and his interactions with the chiefs of staff. Herspring reviews each of the 12 presidents from FDR to George W. Bush, examining divergences between them and the military. He steers the reader through the perils of civilian management of the military while tempering it with respect to the current atmosphere. The author clearly delineates between former military officers and lifelong private citizens who view the presidency through a wide lens.

All presidencies are plagued by fiscal woes and a constant trend of contention that frames the background of policy development during the waging of budget wars and political campaigns. The text illuminates the effects of endless budget battles involving the armed forces.

*The Pentagon and Presidency* is timely and well written, offered without any apologies and adding context to today's dynamic relationship between modern-day presidents and their chiefs of staff. It is a must-read for students of American and military history. Although the book can be challenging since Mr. Herspring takes his time with the necessary details of history and happenstance, this well-appointed discussion is certainly rewarding.

**Rhondra O. Willis, PhD**
*Naval Criminal Investigative Service Liaison Officer*
*Defense Intelligence Agency*

**Predators: The CIA's Drone War on al Qaeda** by Brian Glyn Williams. Potomac Books (http://www.potomacbooksinc.com), 22841 Quicksilver Drive, Dulles, Virginia 20166, 2013, 256 pages, $23.96 (hardcover), ISBN 978-1-61234-617-5.

With *Predators*, historian Brian Williams adds an important study to the ongoing debate over the United States' drone policy. This thoroughly researched history focuses primarily on the development and employment of the RQ-1 Predator and MQ-9 Reaper, particularly in Pakistan. The work manages to remain balanced, providing a fair, sensible, and insightful look into this controversial topic.

The author's research is meticulous and thoroughly documented. Williams read and addressed dozens of reports by authors of various nationalities involved with or interested in drone strikes from 2001 to 2012. Consequently, *Predators* speaks from multiple perspectives, from America's insistence on the importance and precision of drones, to the concerns of Pakistani civilians, to the claims of Taliban officials. Williams's research helps support his overall claim that although drones have caused considerable collateral damage, those incidents are isolated, and these platforms have proven exceptional in their ability to hunt and engage their targets. Furthermore, he argues that US insistence on secrecy and the inability to handle foreign-relations policy hurt the American cause. Williams notes that the Bush and Obama administrations simply failed to explain to the world—Pakistan in particular—the usefulness of these aircraft.

Air Force members, politicians, journalists, and the general public need to read this history. Williams does a brilliant job of addressing the facts, clarifying much of the conjecture and myth surrounding the use of remotely piloted vehicles. Whatever biases he holds are well concealed, and he never allows his feelings to sway the drone argument one way or another. Rather, Williams does exactly what a historian should do by letting the record speak for itself and drawing conclusions only when all research has been exhausted. Although the author makes a solid case in support of drone warfare, he holds nothing back, exploring not only the program's successes but also its failures.

Regardless of public opinion, drones are now an integral part of military operations. *Predators* is a must-read for everyone who wants to understand the virtues and vices of these platforms.

**Capt Ian S. Bertram, USAF**
*Kirtland AFB, New Mexico*

**Crowded Orbits: Conflict and Cooperation in Space** by James Clay Moltz. Columbia University Press (http://cup.columbia.edu/), 61 West 62nd Street, New York, New York 10023, 2014, 240 pages, $30.00 (hardcover), ISBN 978-0-231-15912-8.

Understanding the unique challenges of space proves difficult for many strategists, even those well versed in traditional, earthbound conflict and cooperation scenarios. In *Crowded Orbits*, James Clay Moltz provides an introduction to the basic hurdles within the space environment and across several political arenas. By emphasizing the importance of international cooperation to space, he tries to shed new light on this difficult area while keeping most topics at an introductory level. The book offers basic guidance and assumes that the reader has no previous experience with space topics or concerns. The introduction, flyleaf,

and press release repeatedly refer to the text as a primer; however, they also suggest that it may provide more detailed analysis regarding further cooperative theories.

The author's thesis maintains that any potential space scenario will result in the emergence of a military hegemon, piecemeal agreements between various players, or dedicated international governance. He theorizes that all space conflict and cooperation proceed from the military's desire for control, an economic desire for wealth, or an altruistic, international-governance approach that seeks to solve humanity's future space challenges. *Crowded Orbits* begins by examining both the physical issues and political developments that led mankind into the space age. Other chapters explore military, civil, and commercial advancements before addressing the changes that various political structures created within the space environment. Finally, Moltz summarizes his initial arguments before concluding rather simply that conflict prevention remains everyone's responsibility.

Several strong points immediately appear within the text. All sections are clear and well marked by subject area, allowing easy reference throughout and a quick review if one wishes only to highlight an area rather than proceed from point to point. The repetition of most elements enhances rapid reference. Further, one can easily flip through the work without worrying about being dragged into specific details. The presence of multiple charts and graphs that compare physical characteristics such as launch capacity, first-ever space events, and existing booster-vehicle capability also facilitates easy reference. Additionally, Moltz uses numerous popular allusions to drive home his meanings. The clear section markings, useful charts, and popular approach all contribute to the text's value for readers who require only a cursory overview of space.

However, one wishes that the author had employed a more standardized approach to various high-level topics to permit an easier comparison of chapters. It is difficult to compare the advances that appear in the civil-approaches chapter to those in either the section on military strategies or the one on economic investment since no unified approach standardizes analysis. For example, the chapter on civilian space primarily evaluates development applications of various national agencies, devoting only a couple of pages to civilian theories. Contrastingly, the chapter on military development emphasizes military strategic theory, offering only a few paragraphs on military operational applications. Concentrating on either theory or application from one chapter to the next would emphasize understanding within the scenarios. This dichotomy might appeal to beginners but fails to adequately support Moltz's thesis.

Although the author repeatedly returns to the main points, one feels that he makes no attempt to expand any particular perspective. His own views about considering only international governance as a worthwhile approach lack sufficient evidence. Moltz spends more time on challenges arising from conflicted and crowded space orbits than on any actual conflict in space between either national militaries or civilian governments. Repeatedly, the text stresses that cooperation would be preferable to conflict, but one feels that the latter could be resolved quite adequately by a single hegemon as opposed to techniques of shared governance. The book presents no discussion regarding which method is preferable for either specific or grouped challenges. Moltz suggests no paths to follow in reaching particular goals; moreover, although he advocates that a shared space environment would be in humanity's best interest, the evidence is lacking.

The chapter on "Commercial Space Developments" seems the most useful. Moltz covers all of the areas in which companies seek economic growth, rapidly addressing communications, remote sensing, launch, mining, and energy without promoting any single position or specific development. Reviewing space problems, however, only highlights those areas already

made evident in early chapters. The limited number of available orbits also drives radio frequency congestion and underlines the lack of any defined approach to new corporations within space. Without a military hegemon, piecemeal approach, or global governance, one can imagine the problems posed by the crowded environment. Although the economic potential is substantial, no methods for realizing that potential appear within the work.

Overall, *Crowded Orbits* is a worthwhile starting point for readers unfamiliar with either the space domain or the unique issues presented by today's international environment. It describes many countries' development methods and independent economic possibilities, but the absence of any standardized comparison prevents the advanced reader from following any specific launch path to a conclusion. Certainly, the discussion of problems such as congested orbits within the geostationary belt, limited launch capacity, and the failure to provide a unified global approach is useful. However, the lack of any solution beyond advocating further study severely limits the book's utility. One applauds Moltz's attempt to make a difficult topic accessible to beginners, but a more detailed look at any one section would have increased the text's value to intermediate and advanced students as well.

**Lt Col Mark Peters, USAF**
*Wright-Patterson AFB, Ohio*

**Rebalancing U.S. Forces: Basing and Forward Presence in the Asia-Pacific** edited by Carnes Lord and Andrew S. Erickson. Naval Institute Press (http://www.usni.org/navalinstitutepress), 291 Wood Road, Annapolis, Maryland 21402, 2014, 240 pages, $47.95 (hardcover), ISBN 978-1-61251-465-9.

*Rebalancing U.S. Forces* is a collection of essays relating to the Obama administration's "rebalancing" of forces to the Asia-Pacific region—or, as that action is frequently called, the "Asia-Pacific pivot." The collection—assembled by editors Carnes Lord and Andrew Erickson, faculty members at the US Naval War College—has a distinct naval flavor. That bias, however, does not detract from either the book's relevance or contribution, which is substantial. Arranged geographically, the eight chapters address, in turn, (1) "Guam and American Security in the Pacific," (2) "Japanese Bases and Chinese Missiles," (3) "South Korea: An Alliance in Transition," (4) "The U.S. Strategic Relationship with Australia," (5) "Singapore: Forward Operating Site," (6) "Diego Garcia and American Security in the Indian Ocean," (7) "U.S. Bases and Domestic Politics in Central Asia," and (8) "The Role of Sea Basing."

In the introduction, the editors point out the contrast between Americans' view of US military presence on foreign soil and that of non-Americans:

> Americans have long taken for granted the global network of military bases and facilities of all kinds that the United States acquired following World War II and has largely if not completely retained ever since. . . . But what Americans ignore or take for granted is neither ignored nor taken for granted by . . . friends and allies of the United States. For the latter, an American military presence on their soil raises inevitable questions of national sovereignty, often leads to frictions of various kinds with the host populations and political complications for their governments, and, not least, threatens to embroil them in unwanted military conflicts. . . . Potential adversaries . . . are keenly aware of the presence of American troops and warships on their doorstep and highly sensitive to their activities . . . as well as to any alteration in their numbers or makeup (p. 2).

These themes suffuse each of the essays, accompanied by a historical perspective on each geographic region.

In the first chapter, Erickson and Justin Mikolay focus on Guam. They argue that this territory is an essential element of US national security in the Pacific region because "there are no new islands or new access points to be discovered in East Asia; the U.S. capability to use existing access points and bases must be increased. Building up the American presence on Guam is the single most important step that can be taken to effect this crucial transition" (p. 30).

Toshi Yoshihara then addresses US bases in Japan and their potential vulnerability to Chinese missiles and/or coercive diplomacy backed by the threat of using these missiles. The author bases much of his research on publications of the People's Liberation Army and the "abundant, but largely untapped, Chinese open-source literature on naval affairs" (p. 39).

The book's third chapter, by Terence Roehrig, traces the history of American military basing in South Korea, past efforts to restructure or draw down the US forces there, the cost of those bases, and their future, noting that "while U.S. bases are focused on deterrence and defense of South Korea, they also provide a base for power projection in the region should that become necessary" (p. 72).

In chapter 4, Jack McCaffrie and Chris Rahman chronicle the long history of US engagement with Australia, beginning with the arrival of the first American troops in 1942. Of recent arrangements, the authors write that "American use of Australian territory . . . has been built on three elements: the ongoing salience of . . . joint facilities, expanded training and combined exercising, and access to Australian bases and facilities as points for transit, logistic support, and repair for U.S. ships or aircraft" (pp. 100–101). Despite the shared interest noted in this passage, the presence of American bases in Australia has become the subject of controversy, mostly due to the clandestine nature of the missions of some of those bases, which has even been kept secret from some of the highest government officials in Australia.

Of Singapore, Rahman writes in chapter 5 that although "the United States does not operate its own military bases in Singapore . . . the island . . . has become increasingly important to U.S. Pacific Command, particularly the U.S. Navy, since the end of the Cold War as the foremost Southeast Asian location for in-region support facilities" (p. 118).

Diego Garcia is doubtlessly the most important US military facility in the Indian Ocean region. Indeed, Walter Ladwig III, Erickson, and Justin D. Mikolay, the authors of the sixth chapter, argue that it is "one of the most strategic American bases in the world" (p. 136). This essay, the longest in the book and the most detailed, includes 15 pages of copious endnotes.

In chapter 7, Alexander Cooley writes about US bases in Central Asia—namely, those in Kyrgyzstan and Uzbekistan. These bases came about as a consequence of the war in Afghanistan and have been embroiled in both internal and international political controversy, primarily with Russia.

The last essay, by Sam Tangredi, addresses sea basing by observing that there is no consensus about the definition of that term. Rather, "in its broad vision, 'sea basing' refers to the capability to use the sea in the same way that U.S. forces use overseas regional bases for deterrence, alliance support, cooperative security, power projection, and other forward operations" (p. 200). Tangredi concludes with four recommendations for the Department of Defense to consider regarding this capability.

Each of the essays in *Rebalancing U.S. Forces* is a valuable contribution to the analysis of the United States' global strategy and the role that its bases play in the world, particularly in

the Asia-Pacific region. The questions they raise should be the subject of discussion and debate at the highest levels of the Department of Defense.

**Dr. Clark Capshaw**
*Military Sealift Command*
*Washington Navy Yard, DC*