Research Report

Confronting Emergent Nuclear-Armed Regional Adversaries

Prospects for Neutralization, Strategies for Escalation Management

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In Memoriam

Roger C. Molander
(1940–2012)

Roger Molander, a beloved colleague and senior member of our team, passed away during this study. Roger had a long and distinguished career selflessly devoting his talents to the betterment of humanity. A consummate analyst, mentor, and humanitarian, he devoted his life to safeguarding the United States, first as a senior staff member on the National Security Council and later as a grassroots champion, educating the public on the dangers of nuclear war. He finished his career as a senior researcher at RAND, providing insightful and cogent analysis to help inform and guide the decisions of senior leaders in the Department of Defense and the U.S. government on nuclear policy issues. Ever brilliant, warm, and witty, his presence is deeply missed.

Preface

A growing number of potential adversaries of the United States have concluded that acquiring nuclear weapons is in their best interest. Since the end of the Cold War, the United States has demonstrated an ability to displace the ruling regime of virtually any state that is not nuclear-armed. In response, potential adversaries have sought nuclear weapons to deter the United States from attempting regime change, thereby freeing them to act in ways that might threaten U.S. interests or U.S. regional friends and allies. These developments raise serious risks of escalation should U.S. leaders find it necessary to intervene in regional crises or conflicts.

This report addresses the challenges associated with potential confrontations between the United States and emergent nuclear-armed regional adversaries—that is, hostile states with small nuclear arsenals. It examines prospects for neutralizing their nuclear capabilities via combinations of offensive and defensive options at varying levels of opponent nuclear development and managing escalation risks in conventional wars with them across a range of scenarios.

This research offers insights for air and space power strategy and should inform military operations and national security policy more generally. It should be of interest to those within the U.S. government and others who are involved in or follow the development of U.S. goals, strategy, and policy with respect to future nuclear weapon–related problems. It builds on previous work that RAND Project AIR FORCE has conducted examining the risks of escalation and the potential impacts of U.S. policy in the global security environment:

- *War and Escalation in South Asia*, John E. Peters, James Dickens, Derek Eaton, C. Christine Fair, Nina Hachigian, Theodore W. Karasik, Rollie Lal, Rachel M. Swanger, Gregory F. Treverton, and Charles Wolf, Jr., MG-367-1-AF, 2006
- *Striking First: Preemptive and Preventive Attack in U.S. National Security Policy*, Karl P. Mueller, Jasen J. Castillo, Forrest E. Morgan, Negeen Pegahi, and Brian Rosen, MG-403-AF, 2006
- *Dangerous Thresholds: Managing Escalation in the 21st Century*, Forrest E. Morgan, Karl P. Mueller, Evan S. Medeiros, Kevin L. Pollpeter, and Roger Cliff, MG-614-AF, 2008
- *The Challenge of Nuclear-Armed Regional Adversaries*, David Ochmanek and Lowell H. Schwartz, MG-671-AF, 2008.

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Summary

An Emerging National Security Challenge

We are witnessing the emergence of what some scholars and security analysts have described as the "Second Nuclear Age," an era characterized by a greater diversity of nuclear-armed states, the rise of regional nuclear rivalries, and dramatic asymmetries in capability and interest between regional nuclear powers and other states inside and outside their regions. The United States has important interests in regions in which this process is underway. Consequently, risks are increasing that U.S. leaders will find it necessary to confront emergent nuclear-armed regional adversaries—states with a handful of nuclear weapons and strong antipathies toward the United States or its regional friends and allies.

Should such a confrontation occur, U.S. leaders will want to know whether options exist for neutralizing enemy nuclear capabilities—that is, whether we deny the opponent the effective use of its nuclear weapons through offensive actions to capture or destroy them, defensive measures to defeat attacks, or a combination of both—thereby freeing U.S. forces to operate decisively in pursuit of national interests. If such options are unavailable or unattractive, U.S. forces will need concepts and capabilities that allow them to defeat enemy aggression at the conventional level of conflict while managing risks of escalation and safeguarding the nation's broader interests. This report seeks to help U.S. leaders anticipate and prepare for the challenges they may face in confrontations with nuclear-armed regional adversaries by answering three fundamental questions:

1. What dilemmas would U.S. decisionmakers likely face in military confrontations with emergent nuclear-armed regional adversaries?
2. Under what circumstances, if any, might the United States be able to neutralize a regional opponent's nuclear capabilities?
3. How and in what circumstances can the United States manage escalation while defeating nuclear-armed opponents in conventional war?

Key Findings

The Blurred Nuclear Threshold

One might assume that U.S. leaders could easily deter regional adversaries from using nuclear weapons in confrontations with the United States, because the massive U.S. nuclear arsenal would confront them with stark prospects of certain annihilation. But in fact, leaders of states with small nuclear arsenals might find multiple ways to blur the nuclear threshold if pushed to acts of desperation. Instead of expending all of its weapons in one suicidal spasm, a savvy opponent would more likely use only one or a small number of them, keeping the rest in reserve

to hold additional targets at risk in efforts to deter a U.S. reprisal and compel U.S. forces to stand down. Moreover, in its first step across the nuclear threshold, an opponent might not hit targets that would clearly justify a devastating reprisal. It might, instead, launch a demonstration shot into an unoccupied area outside its country, or detonate a weapon in space to destroy orbital infrastructure or in the atmosphere to generate an electromagnetic pulse (EMP) above U.S. forces or regional cities. In fact, even were the adversary to actually strike a U.S. airbase or concentration of U.S. forces with a nuclear weapon, U.S. leaders would have grave risks to weigh in deciding how to respond, knowing that the adversary might have more weapons at hand and could strike again, perhaps against regional cities, were the United States to try to destroy or topple the regime. Not only would any of these developments create serious dilemmas for U.S. decisionmakers, they would raise important concerns in other states in the region.

Third-Party Considerations

Confrontations between the United States and nuclear-armed adversaries would pose particular problems for third-party states in the region. These problems would be U.S. problems as well, because U.S. forces would need overflight, basing access, or other forms of support from these states, and they, in turn, would need reassurance that siding with the United States would not bring catastrophic destruction to their soil at the hands of the nuclear-armed regional aggressor. Capability gaps and asymmetric interests could make it difficult for U.S. leaders to make such reassurance credible once an aggressive regional neighbor has acquired nuclear weapons. These concerns, and the inherent right of third parties to act independently, could generate escalation dynamics beyond U.S. control. Such risks would be heightened were the adversary to have historical enmities with other powerful regional actors, particularly if they too had nuclear weapons. All of these considerations add to the dilemmas U.S. leaders would face in a confrontation with a nuclear-armed regional adversary.

Dilemmas for U.S. Decisionmakers

While the specific challenges would vary depending on the context of the particular crisis, five prominent dilemmas would likely confront U.S. decisionmakers in any foreseeable scenario. None of these dilemmas would exist in isolation—they would interact in complex ways and differ in salience from one scenario to another.

Avoiding the Adversary's Nuclear Threshold

How can the United States prosecute and win a conventional war against a nuclear-armed regional adversary without driving it across the blurry nuclear threshold? Given the superiority of U.S. conventional forces and the United States' history of imposing regime change on its regional adversaries, opposing leaders could resort to nuclear brandishing, or even the use of nuclear weapons, early in a confrontation. How can U.S. leaders distinguish serious brandishing threats from nuclear bluffing, identify and respect the opponent's critical escalation thresholds,

and fashion U.S. threats that are sufficiently potent and credible to deter the opponent from violating critical U.S. thresholds, all while posturing and employing U.S. forces to defeat the opponent on the field of battle?

Reassuring Vulnerable Partners

How can the United States persuade other states in the region to allow U.S. forces the access and support they would need to defeat a nuclear-armed adversary? Neighboring states vulnerable to the adversary's conventional military forces or nuclear capabilities might be susceptible to enemy coercion, which, if successful, could hamper U.S. military operations and undermine the United States' position as a security guarantor. To secure their cooperation, U.S. leaders will need to extend a deterrent umbrella over its regional partners. Given the improbability of being able to develop and posture leak-proof defenses against all of the ways an adversary could employ nuclear weapons against U.S. forces and other targets in the region, how can the United States make its extended deterrence credible in the eyes of both the adversary and U.S. regional partners?

Persuading Other Powerful Actors to Exercise Restraint

How can the United States persuade other powerful states that feel threatened by a nuclear-armed regional adversary that they should not act independently in ways that could escalate a confrontation or conflict? In several regions in which the United States might have to confront an emerging nuclear power, other states have considerable conventional military capabilities. Some of them also have nuclear weapons, and others could develop or acquire them in a short time if sufficiently threatened by a historical enemy with emergent nuclear capabilities. In the event of a U.S. confrontation with a nuclear-armed opponent in one of these regions, the United States would want to persuade these states to accept U.S. crisis leadership to avoid the escalation that would likely result from them launching independent attacks on the adversary. But how can the United States restrain these states if they do not share U.S. interests and objectives or if they harbor doubts about whether the United States possesses the ability and resolve to protect them?

Restoring Deterrence

Should an adversary cross the nuclear threshold in some way, how can the United States restore deterrence, both during the conflict at hand and afterward? Should such an event occur, U.S. leaders would want to respond in ways that deter further nuclear use and punish enemy leaders for their transgression. But how could they do so without escalating the conflict even further? Should the United States respond to a nuclear attack in kind, or should it rely instead on its conventional superiority to disarm the adversary and inflict punishment or remove the regime from power? Current U.S. policies seek to reduce the salience of nuclear weapons in international discourse, so U.S. leaders might prefer to avoid their use. But could they rely on conventional force alone to disable or destroy an opponent's nuclear weapons before it could use

more of them on regional targets? And if other states see this adversary employ nuclear weapons in defiance of U.S. deterrent threats and not receive a prompt and devastating response in return, what does that portend for the future of the nuclear arms control regime?

Deciding Whether to Attempt Neutralization

Should the United States find itself in a military confrontation with a regional adversary armed with emergent nuclear capabilities, U.S. leaders would likely want to neutralize that threat if possible, thereby freeing U.S. forces to exploit their conventional warfighting superiority. Ideally, neutralization could be achieved via defensive measures alone; however, this is unlikely, given missile defense limitations and risks that the adversary could deliver one or more weapons via other means, such as covert insertion. Therefore, any neutralization operation would have to rely primarily on offensive actions, with defensive measures in place for added security in case the preventive or preemptive attacks failed to destroy or capture all of the enemy's nuclear weapons.

Any U.S. effort to neutralize an opponent's nuclear capabilities, particularly via offensive actions, would pose serious risks. It would be perceived as an effort to clear the way for a U.S. operation to destroy the opponent's military capabilities and remove its leaders from power. Consequently, any U.S. decision regarding an effort to capture, disable, or destroy a regional adversary's nuclear arsenal must carefully weigh the operation's projected value against the risk that some number of weapons might survive and be launched before the operation is complete. Under what circumstances, if any, would the United States be able to neutralize a regional opponent's nuclear capabilities?

Can the United States Neutralize a Regional Opponent's Nuclear Capabilities?

Many factors must be considered when assessing the viability of U.S. options for neutralizing a nuclear-armed opponent. However, the most important variables can be grouped into two categories of consideration: the level of the adversary's nuclear development and the level of conflict. The analysis reported here indicates that neutralization *might* be viable in some circumstances, as long as the adversary does not have the ability to deliver nuclear weapons via ballistic missiles. Even then, attempting to do so would be so risky that U.S. leaders would probably not authorize it unless the opponent has already crossed the nuclear threshold.

Neutralizing an Adversary's Initial Capabilities

A regional adversary is most vulnerable to U.S. efforts to neutralize its nuclear capabilities when it has just developed or otherwise acquired its first handful of weapons. In this condition, regime leaders would be very concerned about the security of these highly valuable, but vulnerable, assets. During peacetime, they would likely store them in a well-guarded central location to protect them from internal security threats. Depending on the degree of hardening of the storage facility, given reliable intelligence on the location of a small, centrally located nuclear arsenal,

U.S. forces might have sufficient conventional strike capabilities to destroy it. However, this alone would not grant them a high probability of success in a preemptive or preventive strike. U.S. leaders would probably not authorize such a provocative act early in a confrontation, while there still appeared to be a reasonable chance of avoiding war. Later, were the crisis to intensify, U.S. leaders might be more willing to risk trying to disarm the opponent, but by then regime leaders' fear of a U.S. disarming strike would likely have overtaken their fear of internal security threats, particularly once the United States began posturing forces in the region. By then, the adversary would likely have dispersed its nuclear weapons, reducing the chances of a successful U.S. strike.

Once a conventional conflict has begun, U.S. leaders might consider pursuing a conventional neutralization campaign. Such a course of action would need to include both defensive and offensive measures to seal off the country and defeat enemy efforts to deliver nuclear weapons or move them elsewhere by air, land, or sea. Assuming this could be done, U.S. forces could then begin a methodical campaign to dismember the adversary's integrated air defense system (IADS) and locate and strike all targets known or suspected to be associated with nuclear weapon production, storage, transshipment, and delivery. The chances of successfully neutralizing an adversary's nuclear capabilities in such a campaign would largely depend on geography and the correlation of forces. A small, weak, island nation would be much easier to seal off and dominate than a large country with land borders and rugged terrain, particularly if the neighbors on any of its borders were unfriendly with the United States and sympathetic with the regime.

In any event, neutralization would be a risky strategy, even against a weak adversary. U.S. efforts to capture or destroy a regime's nuclear deterrent capabilities would confirm its leaders' worst fears—that they had been targeted for regime change. That would likely convince them that they were fighting for their lives, putting them in a use-or-lose dilemma regarding their nuclear weapons. Once committed to employing a nuclear weapon, their ability to deliver it outside their country would depend on whether they could find a chink in the U.S. blockade. Moreover, unless the U.S. air campaign succeeded in destroying all the weapons—something U.S. leaders could never be sure of—the enemy could wait until U.S. or coalition forces arrived and explode one or more of them in their paths as they advance.

Neutralizing an Adversary's Nuclear-Armed Ballistic Missile Capabilities

Efforts to neutralize a regional adversary's nuclear capabilities become much more challenging when it has capabilities for delivering nuclear weapons via ballistic missiles. As in the earlier case, U.S. forces would have the best chance of disarming the adversary early in a confrontation, but U.S. political leaders probably would not authorize it at that point. Later, as the crisis escalates, regime leaders would probably flush the missiles out of garrisons on transporter-erector-launchers (TELs) before U.S. forces could get into position to execute a conventional preemptive strike. Once out of garrison, TELs would be very difficult to find, track, and target. U.S. leaders could never be certain they could find and destroy them all before any nuclear

weapons are launched. Ballistic missile defense (BMD) systems could provide some protection against the missiles missed in a preemptive strike, but given the human costs at stake, probably would not give U.S. leaders enough confidence to authorize such a gamble, no matter how capable or robust system developers or operators profess such defenses to be.

U.S. forces would have no more quick-strike neutralization options during a conventional conflict than they would during a crisis. Efforts to find and destroy the adversary's nuclear weapons on dispersed TELs would face challenges in war at least as great as those encountered at lower levels of confrontation. Worse, were such efforts to start being effective, they would put regime leaders in a use-or-lose dilemma, pushing them toward and potentially over the nuclear threshold. In fact, even efforts to gain the degree of air superiority needed to prosecute such a campaign would signal enemy leaders that the United States is attempting to disarm them in preparation for regime change. That alone might be enough to push them over the brink. Given these daunting challenges, it is highly unlikely that U.S. leaders would authorize efforts to disarm a regional adversary in possession of even only a few nuclear-armed ballistic missiles.

Once the Nuclear Threshold Is Breached

While strong incentives exist to discourage enemy leaders from resorting to the use of nuclear weapons—doing so would make their country an international pariah and reduce their long-term chances of survival considerably—they might conclude they have no choice but to do so if they believe the United States is trying to disarm or kill them or remove their regime. Should such escalation occur, U.S. leaders would face two unenviable questions: First, should they attempt to neutralize the opponent's remaining nuclear capabilities? And second, how can the United States restore the credibility of deterrence and the nonproliferation regime after such a catastrophic breakdown? The answer to the second question essentially forces an answer to the first one: To restore the credibility of future nuclear deterrent threats, the United States would have to respond to an adversary's nuclear attack in a decisive way—it would have to neutralize the adversary's remaining nuclear capabilities and remove the regime.

Although U.S. leaders would prefer to rely on conventional forces alone to accomplish these objectives, it is unlikely that those capabilities could be brought to bear with sufficient speed, simultaneity, and destructive force to disarm an adversary, or even assure substantial damage limitation, before the enemy could launch more weapons. Therefore, the counterstrike would probably have to be done with nuclear weapons. In these circumstances, proportionality would have to be a secondary concern. U.S. leaders could not answer an opponent's nuclear strike on a military force concentration, for instance, with a single nuclear counterstrike on a comparable target and risk the adversary then striking a city in an escalating game of tit-for-tat. Rather, once U.S. leaders were to conclude that a nuclear strike is necessary, U.S. forces would need to launch enough weapons to simultaneously extinguish the enemy regime and destroy as much of its nuclear capabilities as possible before they could do further damage. Such a turn of events would constitute an international catastrophe of immense proportion, but for future U.S. deterrent

threats to have credibility and the nuclear nonproliferation regime to remain viable in the Second Nuclear Age, the world would have to see any regional adversary that resorts to the use of nuclear weapons in war to be promptly and decisively destroyed.

How Can the United States Manage Escalation in Conventional Wars with Nuclear-Armed Opponents?

Although U.S. leaders would probably not risk trying to neutralize an opponent's nuclear capabilities during a crisis or war, the United States would still have to confront a nuclear-armed regional adversary and, if necessary, defeat its military forces in conventional war should the regime challenge U.S. interests. To do so, U.S. leaders will need to posture and employ military forces in ways that achieve objectives while keeping the intensity and scope of conflict within acceptable limits. This will require identifying each belligerent's escalation thresholds and managing the use of force to achieve U.S. military objectives without crossing the enemy's critical thresholds, while also deterring enemy leaders from crossing U.S. thresholds. Most importantly, it will require U.S. leaders to understand that they and enemy leaders share certain interests.

The Importance of Recognizing Shared Interests

A key to managing escalation in conflicts with nuclear-armed opponents is to recognize that both sides would share two important interests. First, neither side would like to see the conflict escalate to a level at which nuclear weapons are employed. While it goes without saying that U.S. leaders would not want the conflict to cross the nuclear threshold, it is also reasonable to expect that opposing leaders would also not want to use nuclear weapons unless they were to feel their survival was seriously threatened. There are several reasons for this, but the most important one is that, while they might be tempted to use one or more nuclear weapons in efforts to safeguard their lives or their regime, they would have to balance that impulse against the risk that that using nuclear weapons might simply guarantee the very destruction they are trying to avoid, if not immediately, then sometime in the future. Crossing the nuclear threshold would profoundly change the tenor of the conflict, and the United States has a well-earned reputation as a powerful and vengeful actor in the international community, one with a long memory.

Second, as counterintuitive as it might seem, both sides would also share an interest in not jeopardizing the survival of the nuclear-armed regional adversary's leaders, regime, or nuclear deterrent capabilities. It goes without saying that the opponent's most fundamental core interest is its own survival, but it is important to emphasize that U.S. leaders share that interest, given that threatening it risks pushing the opponent over the nuclear threshold. So rather than trying to disarm and remove the regime, *the United States must hold the regime hostage, with its continued survival conditioned on its leaders not resorting to the use of nuclear weapons*. Thus, the essence of escalation management when confronting or fighting a nuclear-armed regional adversary lies in *conditional assurance*: the promise to not destroy or remove the regime

conditioned on the threat that the United States will pay whatever cost is needed to do so should the regime cross the critical U.S. escalation threshold.

Managing Escalation in Three Geostrategic Challenges

This research examined how to anticipate and manage the escalation pressures that could emerge at various levels of confrontation in three geostrategic challenges: a maritime confrontation, a conventional invasion of a regional neighbor, and a U.S. compellence campaign. The findings of this examination can be summarized as follows: The farther the conflict takes place from the adversary's home territory, the freer the United States will be to use whatever force is necessary to protect its interests without fear of nuclear escalation. Distant conflicts are less likely to threaten the survival of the opposing regime, thus undermining the credibility of any nuclear threats its leaders may issue. Nonetheless, in all confrontations, U.S. leaders should use force judiciously, employing only enough to secure U.S. objectives. More detailed insights follow.

A Maritime Confrontation

What escalation dynamics might arise in a confrontation at sea would depend a great deal on where it occurs. Given the United States' asymmetric advantage in conventional force projection capabilities in most areas of the world, a regional adversary would be unable to present a credible military challenge to U.S. forces unless the confrontation were to occur close to its bases and relatively far from U.S. military assets in the region. An opponent finding itself in a confrontation farther away would have few near-term avenues for escalation. It would not be able to make a nuclear threat credible, given that U.S. operations against its forces would not threaten any of its critical escalation thresholds. Adversary leaders might resort to nuclear brandishing anyway as a coercive ploy, but they would almost certainly be bluffing. U.S. leaders could issue counter-threats or simply ignore the opponent's remonstrances, whichever they determine would best serve U.S. interests in the context of the broader geopolitical situation.

While the opponent would likely have few options were a maritime confrontation to occur far from its shores, the dynamics would be different were it to occur closer to its homeland, with little or no U.S. military capabilities immediately available for timely a response. How such a conflict would unfold would depend in large part on just how close to the opponent's home territory the confrontation occurs and how soon the United States could bring its military capabilities to bear. Were it to take place beyond the range of the opponent's land-based IADS, events would likely play out in ways similar to those described in the more distant crisis scenario. But should it take place within the coverage of the opponent's homeland IADS, U.S. leaders would need to degrade the IADS locally, without dismembering it in a way that would expose the regime or its nuclear capabilities to attack. That would suggest tactics emphasizing electronic warfare on local warning and command-and-control targets and engaging enemy fighters in the air, versus conducting offensive counterair (OCA) strikes on enemy airbases,

thereby avoiding kinetic attacks on mainland targets. In any case, such an operation would require firm conditional assurances that the United States is pursuing only limited objectives.

A Cross-Border Invasion

Defending a regional friend or ally from a combined-arms, cross-border invasion by a nuclear-armed regional adversary would present sizable challenges. In such a scenario, U.S. leaders should not try to deploy a major ground force in territory contiguous to the opponent. Throwing heavy U.S. ground forces into the fight might suggest to enemy leaders that the United States is posturing for regime change, and the assembly points and logistics tail of such forces would offer inviting targets for nuclear strikes, were enemy leaders to feel sufficiently threatened when the tide of battle turned against them. A safer course of action would be to posture airpower in regional bases close enough to win air superiority over contested territory, conduct strike operations against the invasion force, and provide close air support to friendly forces should a U.S. military intervention become necessary. U.S. leaders could also visibly deploy nuclear-capable bombers to the region and begin patrols. However, U.S. regional basing should, to the greatest extent possible, be done outside the threat rings of the adversary's nuclear strike capabilities.

Should it become necessary to intervene in the conflict, U.S. airpower should be brought to bear in direct support of the beleaguered allied army, multiplying its effectiveness in the fight, without threatening the survival of the enemy regime. Assuming this approach would be effective, U.S. leaders would still need to take several additional precautions. First, as in the maritime scenario, they would have to gain air superiority using defensive counterair sorties over the battlefield, versus conducting OCA strikes on bases in the enemy's homeland. Second, all interdiction strikes and attacks on other rear-area activities supporting enemy forces would need to be done to the greatest extent possible against targets inside the defending state. Finally, as enemy forces begin suffering the effects of U.S. airpower and allied forces begin driving them back, U.S. leaders should resist the temptation (and any allied pressure) to punish the enemy or add demands that would significantly exceed the *status quo ante bellum*. Ultimately, enemy leaders should be allowed to withdraw their forces and get some concession in the settlement, even if only symbolic, that would allow them to save face and claim some measure of victory in front of domestic constituents.

A Compellence Campaign

The notional scenario explored in this analysis involved a U.S. effort to compel a nuclear-armed state devolving into civil war to stop conducting military attacks on dissident groups. This kind of scenario would confront U.S. leaders with daunting challenges. U.S. leaders could posture airpower in the region and issue demands that the adversary cease its attacks, but it is difficult to compel a state to stop an ongoing military operation short of achieving its objectives without

demonstrating that one can deny it success in that operation. Threats to do so before actually employing force would tend to ring hollow against an opponent with nuclear weapons.

As such an operation would require striking targets in the enemy homeland, it would be fraught with escalation risk. U.S. forces would have to suppress the opponent's IADS to apply airpower with any persistence, and as previously mentioned, attempting to do that would likely cross critical escalation thresholds. Moreover, it would be difficult to anticipate how a campaign of sustained bombing would affect the dynamics of the ongoing struggle within the adversary's state. It might galvanize public support behind the regime, thereby allowing it to become even more ruthless in its suppression of dissent, or it might so weaken the regime that it would fall to the onslaught of the groups against it, raising anxious questions as to who would have control of the nuclear weapons.

Given the low probability that a compellence campaign against a nuclear-armed adversary would be successful and the daunting uncertainties and dangers that would result from attempting it, U.S. leaders would be well advised in not intervening in this kind of crisis.

Recommendations for the U.S. Air Force

Developing strategies for confronting a nuclear-armed regional adversary are the responsibility of political and joint military leaders. Nonetheless, there are important steps the U.S. Air Force can take to support these functions more effectively. We offer the following recommendations:

Organization and Equipment

Although political leaders are unlikely to allow U.S. forces to try to neutralize a regional adversary's nuclear capabilities, the Air Force should continue devoting a portion of its budget to research and development on capabilities to do so to the extent that such capabilities also support other missions. Should enemy leaders demonstrate a wanton disregard for human life by employing one or more nuclear weapons, U.S. leaders might conclude they have no alternative but to disarm the adversary to limit its ability to cause more damage. In addition, the Air Force may need to invest in greater capability to conduct conventional strike operations from afar, in order to defeat a nuclear-armed regional adversary's conventional forces while operating from bases beyond the range of its conventional and nuclear strike capabilities. To organize and equip the force for these tasks, we recommend the following:

Recommendations

1. Continue research and development on methods and capabilities to find, fix, track, target, and assess enemy nuclear weapon capabilities.
2. Continue research and development on ballistic and cruise missile defense systems, methods, and concepts.
3. Conduct research on how to rebalance the force to better enable posturing airpower to conduct conventional strike operations from afar.

Doctrine, Education, and Training

Air component commanders and their staffs play essential roles in developing prospective courses of action, evaluating them, and conducting operational planning. Therefore, they have a responsibility to advise joint commanders and policymakers on what escalation risks prospective courses of action present and offer recommendations for managing those risks. To prepare airmen for these roles and responsibilities, we recommend the following:

Recommendations

1. Revise Air Force doctrine to better capture the risks of escalation and the importance of managing it.
2. Educate air component commanders on the principles of escalation management.
3. Emphasize escalation management in Air Force professional military education.

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1. An Emerging National Security Challenge

Introduction

Over the course of the 21st century, the international environment is likely to evolve in ways that present unprecedented challenges to the national security of the United States. One of the greatest of these challenges will be the need to protect U.S. interests amid the proliferation of nuclear weapons to a rising number of regional powers. This trend, which some scholars and security analysts have described as the "Second Nuclear Age," is characterized by a greater diversity of nuclear-armed states, the emergence of regional nuclear rivalries, and dramatic asymmetries in capability and interest between regional nuclear powers and other states inside and outside their regions.[1] The United States has important interests in the regions in which this process is underway. Consequently, risks are increasing that U.S. leaders will find it necessary to confront emergent nuclear-armed regional adversaries—states with a handful of nuclear weapons and strong antipathies toward the United States or its regional friends and allies.[2]

The United States has faced such challenges several times in the past. The first instance occurred shortly after the Soviet Union exploded a nuclear device in 1949 and immediately began building an arsenal of weapons. The People's Republic of China presented the second challenge after its first successful nuclear test in 1964.[3] More recently, India, Pakistan, and North Korea have also entered the nuclear club in direct defiance of the nonproliferation regime and U.S. policies. Of these five states, the Soviet Union, China, and North Korea were considered U.S. adversaries when they emerged as nuclear powers. During the periods of Soviet and Chinese nuclear emergence—that is, until they had enough nuclear weapons that a disarming strike was clearly infeasible—they and the United States managed to navigate several dangerous confrontations without resort to war, largely because they enjoyed certain geographical advantages and asymmetric conventional strengths which counterbalanced U.S. nuclear superiority in ways that caused both sides to be cautious.[4] Similarly, North Korea, which is, by

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[1] See Paul Bracken, *Fire In the East: The Rise of Asian Military Power and the Second Nuclear Age*, New York: Harper Perennial, 1995; David Krieger, "The Second Nuclear Age," Santa Barbara, Calif.: Nuclear Age Peace Foundation, September 23, 2003; Paul Bracken, "The Structure of the Second Nuclear Age," November 5, 2003.

[2] As we shall later explain, antipathies between the United States and such adversaries both incentivize their pursuit of nuclear weapons and are aggravated by U.S. policies designed to punish them for developing those capabilities. See Appendix A for an analysis of proliferation trends and emerging threats that define the Second Nuclear Age.

[3] Between those two events, the United Kingdom and France developed nuclear weapons capabilities with U.S. help or acquiescence due to their status as U.S. allies. Later, Israel and South Africa also developed nuclear capabilities, but did not face U.S. censure because they did not publically acknowledge that they had them. While these states were emergent nuclear powers, none were adversaries of the United States.

[4] Some U.S. defense officials advocated conducting preventive strikes against emergent Soviet nuclear capabilities during the Truman administration, and the prospects of preventive nuclear war against the Soviet Union were

some estimates, already beyond the emergent phase of its nuclear development, has enjoyed the advantages of mountainous terrain and heavy conventional forces in close proximity to Seoul, conditions that have discouraged U.S. and South Korean leaders from attempting to disarm that regime.[5] Such circumstances would not exist should Iran obtain a nuclear weapon capability and a military confrontation occur, and they might not be present in confrontations with other future emergent nuclear-armed regional adversaries.

Today, the United States enjoys dramatic advantages in both the nuclear and conventional domains against all new opponents likely to emerge in this category. Yet confrontations with such states, should they occur, will still create serious dilemmas for U.S. leaders. While the United States will assuredly maintain a sizable conventional military advantage over other nations in any foreseeable security environment, it will face operational challenges to its current way of war if its adversaries have even a few nuclear weapons. Military operations against a regime's leadership, nuclear capabilities, conventional military forces, or other dimensions of its hold on power could trigger rapid escalation. When confronted with U.S. conventional superiority, enemy leaders could respond with nuclear brandishing, issuing explicit or implicit threats to use nuclear weapons to deter U.S. or coalition forces from attacking them or compel them to cease operations already underway. More serious threats to their survival, real or imagined, could result in the opponent unleashing indirect nuclear attacks to generate mass disruption, such as detonations in space to destroy orbital infrastructure or in the terrestrial environment to create fallout on key third parties. And should enemy leaders become convinced that U.S. or coalition forces are making a serious effort to disarm, decapitate, or remove their regime, they could even resort to direct nuclear attacks on military or civilian targets in the region, while keeping some of their nuclear weapons in reserve to hold additional targets at risk.[6]

Despite these dangers, it may be necessary for the United States to threaten or employ force against emergent nuclear-armed adversaries to protect its regional interests or sustain the credibility of its nonproliferation policies. U.S. leaders have publically stated that "all options are on the table" when dealing with Iran. This policy is relevant not only for stopping Iran from acquiring nuclear weapons; it is also aimed at deterring additional states from going down that path. In fact, some options for strengthening the nonproliferation regime might even include

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studied in earnest during the Eisenhower administration. Presidents Kennedy and Johnson also considered conducting preventive strikes against China during their administrations. For an analysis of these cases, see Karl P. Mueller, Jasen J. Castillo, Forrest E. Morgan, Negeen Pegahi, and Brian Rosen, *Striking First: Preemptive and Preventive Attack in U.S. National Security Policy*, Santa Monica, Calif.: RAND Corporation, 2006, pp. 121–170.

[5] Unclassified estimates of how many nuclear weapons North Korea has been able to build to date vary widely, depending on whether one assumes Pyongyang has secretly operated any additional centrifuges besides the known one at Yongbyon. In one source, estimates range from as few as 13 weapons if only Yongbyon has been operating to as many as 30 weapons if North Korea has been operating Yongbyon and an additional centrifuge. See David Albright and Christina Walrond, *North Korea's Estimated Stocks of Weapon-Grade Plutonium and Uranium*, Washington D.C., Institute for Science and International Security (ISIS), 2012.

[6] Peter Wilson and Elbridge A. Colby, *Fighting a Nuclear-Armed Regional Opponent: Is Victory Possible?* Washington, D.C.: Center for Strategic and Budgetary Assessments, April 2008, pp. 3–6.

confronting states that have already acquired nuclear weapons in defiance of U.S. policies.[7] Should such confrontations occur, U.S. leaders will want to know whether options exist for neutralizing enemy nuclear capabilities—that is, denying the opponent the effective use of its nuclear weapons through offensive actions to capture or destroy them, defensive measures to defeat attacks, or a combination of both—thereby freeing U.S. forces to operate decisively in pursuit of military objectives. If such options are unavailable or unattractive, U.S. forces will need concepts and capabilities that allow them to defeat enemy aggression at the conventional level of war while managing risks of escalation and safeguarding the nation's broader interests.

Purpose of This Research

This research seeks to help defense policymakers and the U.S. Air Force in particular understand and prepare for confrontations with emergent nuclear-armed regional adversaries by informing the development of strategic concepts and identifying capabilities that may be needed to execute them.[8] It further seeks to help prepare U.S. combatant commanders and political leaders for the strategic decisionmaking and escalation management challenges they would likely face in such confrontations, particularly if they result in armed conflict.[9] While it is impossible to predict the exact nature of any future crisis or conflict without knowing the particular context in which it could occur and the specific belligerents it would involve, emergent nuclear powers tend to exhibit certain behaviors, due to the fact that their nuclear doctrines are underdeveloped, their leaders are inexperienced in nuclear diplomacy, and they feel vulnerable regarding the survivability of their fledgling nuclear arsenals.[10] Similarly, states that find themselves in

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[7] The Deterrence Joint Operational Concept states: "Deterrence operations convince adversaries not to take actions that threaten US vital interests by means of decisive influence over their decision-making. Decisive influence is achieved by credibly threatening to deny benefits and/or impose costs while encouraging restraint by convincing the actor that restraint will result in an acceptable outcome" (U.S. Department of Defense, *Deterrence Operations: Joint Operating Concept*, Version 2.0, December 2006, p. 3).

[8] For discussions on the use of concepts of operations as vehicles for identifying the military capabilities needed for particular mission areas, see Glenn A. Kent, *Concepts of Operations: A More Coherent Framework For Defense Planning*, Santa Monica, Calif.: RAND Corporation, N-2026-AF, August 1983; and John Birkler, C. Richard Neu, and Glenn Kent, *Gaining New Military Capability: An Experiment in Concept Development*, Santa Monica, Calif.: RAND Corporation, MR-912-OSD, 1998.

[9] In 2008 RAND researchers David Ochmanek and Lowell Schwartz identified the risk that, due to the overwhelming conventional military superiority that the United States can bring to bear in regional conflicts and Washington's demonstrated propensity for imposing regime change, nuclear-armed regional adversaries might have incentives to use nuclear weapons in confrontations with U.S. forces. Consequently, they recommended the U.S. Air Force develop means to *prevent* such adversaries from using their nuclear capabilities by destroying them before and after launch. This study seeks to build on that research by examining whether and in what circumstances preventive strategies would be viable. It further explores strategies for managing escalation while defeating nuclear-armed adversaries in conventional war for circumstances in which prevention is not viable. See David Ochmanek and Lowell H. Schwartz, *The Challenge of Nuclear-Armed Regional Adversaries*, Santa Monica, Calif.: RAND Corporation, MG-671-AF, 2008.

[10] For a fuller discussion of these characteristics and the behaviors they could prompt, see Forrest E. Morgan, Karl P. Mueller, Evan S. Medeiros, Kevin L. Pollpeter, and Roger Cliff, *Dangerous Thresholds: Managing Escalation in*

confrontation with the United States typically do so as a result of conflicts of interest stemming from their regime type and behavior in the region. In this regard, the pursuit of nuclear weapons is both a source and a product of these states' enmity with the United States, as Washington attempts to enforce the nonproliferation regime and regional adversaries seek ways to offset U.S. conventional superiority in order to ensure the survival of their regimes. In fact, nuclear programs are likely to be an early focus of U.S. contention with any emerging power, even before other issues come to the fore. But whatever the root causes, it is at the intersection of these two sets of actors—emergent nuclear powers and regional adversaries of the United States—that future confrontations could be most likely and most dangerous. Therefore, this research examines the implications for air and space power strategy of potential confrontations with emergent nuclear-armed regional adversaries across a range of scenarios and levels of opponent nuclear maturity. The potential need to defend U.S. interests against aggressive nuclear-armed regional powers raises several important questions that this report seeks to answer:

1. What dilemmas would U.S. decisionmakers likely face in military confrontations with emergent nuclear-armed regional adversaries?
2. Under what circumstances, if any, might the United States be able to neutralize a regional opponent's nuclear capabilities?
3. How and in what circumstances can the United States manage escalation while defeating nuclear-armed opponents in conventional war?

Research Methodology

To answer these questions, the RAND project team conducted research in several phases. The first entailed an assessment of the many ways a regional adversary could use nuclear weapons during a confrontation with the United States, the challenges these developments could create for U.S. relations with other states in the region, and the dilemmas they would present to U.S. decisionmakers. As this review was underway, researchers examined the body of literature on deterrence and escalation management theory, starting with work performed during the Cold War and concluding with more recent developments at RAND and elsewhere.

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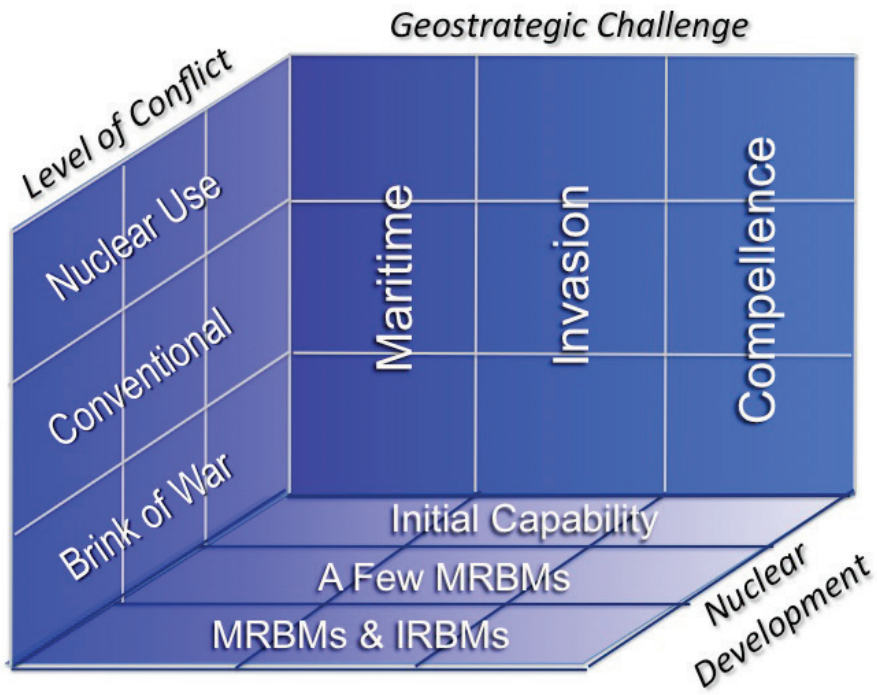
the 21st Century, Santa Monica, Calif.: RAND Corporation, MG-614-AF, 2008, pp. 85–88; Ochmanek and Schwartz, 2008, pp. 37–39.

With this foundational work complete, the project team devised a three-dimensional framework for conducting a parametric analysis of the neutralization and escalation management challenges U.S. leaders could face in crises[11] and conflicts with nuclear-armed regional adversaries.[12] Figure 1.1 illustrates that framework.

Figure 1.1. Framework for Parametric Analysis



The first dimension of the analytical framework examines prospects for neutralizing an opponent's nuclear capabilities at three levels of nuclear development via combinations of offensive and defensive actions. The lowest level of nuclear development is described as *Initial Capability*, a condition in which the opponent has just developed or otherwise acquired its first nuclear weapons. At this stage, the opponent is posited to have about three nuclear weapons—U.S. leaders would likely be unsure of the exact number at any given time—not yet engineered

[11] Throughout this report, when we use the word *crisis*, we are referring to confrontations between states in which tensions rise suddenly, causing national leaders to worry that war may be close at hand. In such cases, each actor's intentions, capabilities, and immediate actions are often difficult for others to discern, creating perceptions that the time available for critical decisionmaking is limited and the situation could deteriorate rapidly. Such conditions create substantial risks of miscalculation and catastrophic accident. The characteristics described here are developed in more detail in Ned Lebow, *Between Peace and War: The Nature of International Crises*, Baltimore, Md.: Johns Hopkins University Press, 1984, pp. 7–12.

[12] In calling this approach a "parametric analysis," we do not mean to imply that formal statistical techniques were employed; rather, the analysis was parametric in that we varied the levels of selected elements in each scenario while holding other factors stable in order to explore how differences in those variables would affect neutralization prospects and escalation dynamics.

for delivery by missile, but potentially employable by airdrop, surface vehicle, or covert insertion. Analysis at the next level of nuclear development, shown in Figure 1.1 as *A Few MRBMs*, assumes that the opponent would have about a dozen nuclear weapons, with some of them mated to medium-range ballistic missiles (MRBMs). This level of analysis postulates that the missiles would be garrisoned in a central location but deployable on mobile launchers, with the remaining nuclear weapons located in one or more storages sites and available for airdrop or other means of delivery. By the third stage of nuclear development, labeled *MRBMs and IRBMs*, the opponent is posited to have between one dozen and two dozen nuclear weapons, with some of them mated to intermediate-range ballistic missiles (IRBMs) in addition to those on MRBMs. At this stage of development, the analysis posits the missiles to be on mobile launchers garrisoned in several hardened facilities housed in mountain tunnels.

As Figure 1.1 indicates, the contexts for exploring neutralization options and potential escalation dynamics were provided in the second dimension of the analytical framework—three geostrategic challenges, each examined at three levels of conflict. The geostrategic challenge scenarios include a *Maritime* confrontation between U.S. air and naval forces and those of the opponent; an *Invasion* scenario in which U.S. forces are called on to defend a regional neighbor from a nuclear-armed adversary's cross-border, combined-arms offensive; and a *Compellence* scenario in which U.S. airpower is employed to compel the leaders of a nuclear-armed state to cease attacks on rebel forces during a civil war. Each scenario is examined in the third dimension of the analytical framework, which consisted of three levels of conflict: the *Brink of War*, during *Conventional* war, and after the enemy has resorted to *Nuclear Use.*

The parametric analysis was carried out in a series of map exercises in which the project team, additional RAND subject matter experts, and selected participants from the staff of Headquarters U.S. Air Force worked through the notional scenarios, exploring neutralization prospects and potential escalation dynamics.[13] Objectives of the parametric analysis included identifying the breakpoint in the viability of neutralization strategies along the levels of *Nuclear Development* and the breakpoint in the viability of escalation management strategies along the levels of *Geostrategic Challenge*. That is to say, we sought to determine the points at which neutralization and escalation management clearly could not be done. Exercise participants also identified questions for further research, which project team operations research specialists later conducted in follow-on analyses.

[13] A map exercise is an operations research analysis carried out in a war game format. Participants are selected subject matter experts in strategy, conventional and nuclear operations, logistics, technology, operations research, and other relevant disciplines. They are presented a geostrategic challenge, along with U.S. objectives and constraints, and devise alternative courses of action (COAs). They then do calculations to assess the feasibility and effects of their COAs in the face of enemy countermoves. The objective is to provide insight into the level of capabilities needed to achieve strategic and operational goals and "tee up" additional operational analysis. The results are first-order assessments of the interdependencies between strategy, operations, and capabilities.

How This Report Is Organized

This report is organized in five chapters. Chapter Two sets the geostrategic context, illuminating the challenges the United States would likely face in confrontations with emerging nuclear-armed regional powers. It explores how, when confronted by the United States, a state with fledgling nuclear capabilities could use one or more of its weapons in ways that blur the nuclear threshold; examines the complex multi-party dynamics that could emerge in crises and wars with such actors, given the capabilities and vulnerabilities of other states in the region; and illuminates the decisionmaking dilemmas U.S. leaders would face in such crises and wars.

Chapter Three assesses in what circumstances neutralizing a regional adversary's emergent nuclear capabilities might be viable. It first identifies the range of options an adversary would have for employing, hiding, or moving its nuclear weapons during a confrontation. Then it assesses what U.S. forces would need to do to find, identify, target, and strike an opponent's nuclear weapons in three levels of conflict, at each of three levels of opponent nuclear development.

Chapter Four offers U.S. leaders guidance for managing escalation in crises and conflicts with nuclear-armed regional adversaries. It briefly explains the principles of *threshold management*, a logical framework RAND has developed for understanding and managing escalation dynamics in the Second Nuclear Age. Then it applies these principles in an analysis of prospects of and approaches for escalation management at three levels of conflict in each of three geostrategic challenges.

Finally, Chapter Five synthesizes observations from the foregoing chapters and discusses how U.S. leaders can meet the challenges that nuclear-armed regional adversaries might present in the Second Nuclear Age. It summarizes findings on prospects for neutralization and escalation management, puts them in geostrategic context, and offers recommendations for the U.S. Air Force.

The report also includes two appendixes. Appendix A provides a closer examination of the Second Nuclear Age, providing additional analysis supporting the work done in Chapter Two. Appendix B summarizes the evolution of nuclear deterrence and escalation management concepts developed during the Cold War. It explains how approaches proposed in that era were inadequate even in the bipolar era and why they are even less appropriate for the Second Nuclear Age.

2. Bringing the Challenge into Focus

This chapter examines the some of the challenges U.S. leaders would face in a confrontation with an emergent nuclear-armed regional adversary. It explains why the nuclear threshold might be less distinct in U.S. confrontations with emergent nuclear powers, compared with the dramatic brink the superpowers faced in Cold War crises, and considers how third-party state capabilities and vulnerabilities might alter the dynamics of future regional crises. With these factors illuminated, the chapter concludes with a summary of what dilemmas U.S. leaders could face in confrontations with emergent nuclear-armed regional adversaries.[1]

The Blurred Nuclear Threshold

Thinking in the Cold War paradigm, one might assume there is still a sharp line, or nuclear "brink," distinguishing between when a state does and does not use nuclear weapons. In that conception, an emergent nuclear state confronted by a more powerful opponent might be expected to either plunge over that brink, launching all of its weapons against the opponent's military forces or regional population centers, or draw back from it in fear. When seen in such stark terms, deterring a regional adversary from crossing the nuclear threshold should not be a difficult challenge for the United States, with its overwhelming conventional and nuclear capabilities. One simply makes it clear to the adversary that a nuclear attack on U.S. forces or regional targets would result in a devastating conventional or nuclear response, resulting in the removal of his regime and, perhaps, the destruction of his country. Unfortunately, the problem is not so simple.

Leaders of states with small nuclear arsenals would actually have multiple options at their disposal if pushed to acts of desperation. Instead of expending all of their weapons in one suicidal spasm, a savvy opponent would more likely use only one or a small number of them, keeping the rest in reserve to hold additional targets at risk in efforts to deter a U.S. reprisal and compel U.S. forces to stand down. Moreover, in their first step across the nuclear threshold, adversaries might not hit targets that would clearly justify a devastating reprisal. They might, instead, simply conduct a nuclear test to demonstrate their capability and thereby communicate a compellent threat. A bolder statement might consist of an above-ground demonstration, releasing radiation to drift onto U.S. forces or third-party territories. A demonstration shot into an unoccupied area outside the adversary's country would be more threatening, and one in space

[1] This chapter draws on previously unpublished work done in the PAF research project "Conventional Conflict with Nuclear Rogues." The team that conducted that analysis was led by Ryan Henry and included Roger C.Molander, Forrest E. Morgan, Heather Peterson, Harun Dogo, Jessica Hart, Ely Ratner, Robert Reardon, and Lisa Saum-Manning.

destroying orbital infrastructure or in the atmosphere generating an electromagnetic pulse (EMP) above U.S. forces or regional cities would be even more provocative. Finally, even were the regional adversary to actually strike a U.S. airbase or concentration of U.S. forces with a nuclear weapon, U.S. leaders would have grave risks to weigh in deciding how to respond, knowing that the adversary might have more weapons at hand and could strike again, perhaps against regional cities, if they tried to destroy or topple its regime.

In sum, there are many ways an opponent could use nuclear weapons that would create serious dilemmas for U.S. decisionmakers, and any use of a nuclear weapon during a crisis or conflict would dramatically increase the interests at stake. The need to both deter such events and respond to them in a measured way if they occur poses major challenges. This places a premium on achieving as much mutual understanding as possible regarding where each side's escalation thresholds lie in order to keep a U.S. confrontation with a nuclear-armed regional adversary from spinning out of control.

Third-Party Considerations

Several important third-party considerations would factor into in the dynamics of any confrontation between the United States and a nuclear-armed regional adversary. Aside from the most obvious questions—i.e., the political orientation of each third party and where it stands vis-à-vis the dispute between the United States and the regional adversary—the most important considerations include the degree to which the United States can rely on friendly states for access, overflight, or other forms of support; the degree to which they perceive themselves vulnerable to the regional aggressor; and whether they possess nuclear weapons or other means of escalating the confrontation or conflict independent of U.S. desires.

Confrontations between the United States and nuclear-armed adversaries pose particular problems for third-party states in the region. In many cases, the United States would be intervening to defend the interests or territorial integrity of a regional friend or ally. In such cases, it is reasonable to assume that the defended parties would grant access to U.S. forces and provide whatever other forms of support are needed to facilitate their defense. But that should not be a foregone conclusion, because whether any particular state friendly to the United States is willing to stand up to an aggressive nuclear-armed neighbor will depend on whether U.S. leaders can credibly reassure it that the United States can and will defend it, not only from conventional aggression but, potentially, from a nuclear attack as well. Moreover, U.S. forces may also need overflight, access, or support from other states in the region, and those states will need reassurance that siding with the United States will not bring catastrophic destruction to their soil at the hands of the nuclear-armed regional aggressor.

Capability gaps and asymmetric interests could make it difficult for U.S. leaders to credibly reassure regional allies and friends that the United States could keep its commitments to defend them from an aggressive state once that adversary has acquired nuclear weapons. For instance,

U.S. leaders might have difficultly convincing regional partners that the United States would have the capability to defend them against nuclear-armed missiles, given perceived limitations in the coverage and effectiveness of ballistic missile defenses.[2] More seriously, U.S. leaders might have difficulty convincing regional partners that the United States has sufficient resolve to defend them and can maintain that resolve over the course of a conflict, given the fact that, although the adversary would not present an existential threat to the U.S. homeland, it could threaten U.S. forces in the region with nuclear destruction.[3]

These factors, and the inherent right of third parties to act independently, could generate escalation dynamics that are beyond U.S. control.[4] Such risks would be heightened in a U.S. confrontation with an emergent nuclear power were that state to have historical enmities with other powerful regional actors, particularly if they too had nuclear weapons. Then U.S. leaders could find themselves facing multiple deterrence and assurance challenges at once: the need to deter the adversary from attacking the third party; the need to persuade or deter the third party from attacking its now nuclear-armed historical enemy; the need to reassure the third party that the United States can deter the nuclear-armed regional adversary from attacking it, or defend it from attack should deterrence fail; and, finally, the need to deter the adversary from using nuclear weapons against any actor while assuring it that it will not face ultimate destruction or regime change if it complies with deterrent demands. All of these requirements may not be mutually compatible.

These Factors Increase Risks of Conflict Escalation

All of these considerations are potential sources of instability in any crisis or conflict in which an emergent nuclear-armed adversary is involved. Historically, new nuclear powers have sometimes overestimated the political utility of their arsenals and sought ways to use them to underwrite conventional or unconventional efforts to change the status quo. This has resulted in dangerous crises within the first few years after they developed nuclear capabilities, followed by much greater caution and restraint afterward.[5] Emergent nuclear-armed states will probably not be

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[2] Jean-Loup Samaan and Guillaume Lasconjarias, "The Israeli Experience in Missile Defense: Lessons for NATO," Issue Brief, Washington, D.C.: Atlantic Council, Brent Scowcroft Center on International Security, April 2013.

[3] Justin V. Anderson, Jeffery A. Larsen, and Polly M. Holdorf, *Extended Deterrence and Allied Assurance: Key Concepts and Current Challenges for U.S. Policy*, Colorado Springs, Colo.: USAF Institute for National Security Studies, INSS Occasional Paper 69, September 2013.

[4] Brad Roberts, "Extended Deterrence and Strategic Stability in Northeast Asia," unpublished paper, National Institute for Defense Studies of the Ministry of Defense of Japan, Spring 2013.

[5] The United States, China, Pakistan, and the Soviet Union all encountered crises that were to some degree based on false conceptions about the strategic utility of nuclear weapons. See Robert Jervis, "War and Misperception," *Journal of International History*, Vol. 18, No. 4, Spring 1988, pp. 677–79; Gordon H. Chang, "To the Nuclear Brink, Dulles, and the Quemoy-Matsu Crisis," *International Security*, Vol. 12, No. 4, Spring 1988, pp. 96–123; H. W. Brands Jr., "Testing Massive Retaliation: Credibility and Crisis Management in the Taiwan Strait," *International Security*, Vol. 12, No. 4, Spring 1988, pp. 124–51.

immune to this temptation in the future. They are also likely to have organizational pathologies that make their nuclear learning curves steep. Authoritarian states with poor civil-military relations, limited resources, and closed and opaque decisionmaking structures will be especially prone to biases and poor self-evaluation.[6] As a result, the risk of miscalculation for these states is likely to be greater, as will U.S. uncertainty in their actions, as compared with the levels of mutual understanding the superpowers achieved in the latter stages of the Cold War. This opacity, along with uncertainties related to an emergent nuclear state's capabilities, force posture, and doctrine, could dramatically increase the risk of miscommunication and miscalculation in any confrontation with the United States, particularly in regard to the critical issue of the adversary's thresholds for nuclear brandishing or employment.

Dilemmas for U.S. Decisionmakers

The foregoing factors suggest that the United States would likely face wide-ranging and difficult choices in any confrontation with an emergent nuclear-armed regional adversary. While the specific challenges would vary depending on the context of the particular crisis, five prominent dilemmas would likely confront U.S. decisionmakers in any foreseeable scenario. It is important to emphasize at the outset that none of these dilemmas would exist in isolation. They would interact in complex ways and differ in salience from one scenario to another.

Avoiding the Adversary's Nuclear Threshold

How can the United States prosecute and win a conventional war against a nuclear-armed regional adversary without driving it across the blurry nuclear threshold? Given the superiority of U.S. conventional forces and the United States' history of imposing regime change on its regional adversaries, opposing leaders would likely be fearful of U.S. military power, and they might assume from the outset that U.S. objectives include neutralizing their nuclear deterrent capabilities and removing them from power. As a result, they could resort to nuclear brandishing, or even the use of nuclear weapons, early in a confrontation. How can U.S. leaders distinguish serious brandishing threats from nuclear bluffing, identify and respect the opponent's critical escalation thresholds, clearly communicate U.S. escalation thresholds, and fashion U.S. threats that are sufficiently potent and credible to deter their violation, all while posturing and employing U.S. forces to defeat the opponent on the field of battle?

Reassuring Vulnerable Partners

How can the United States persuade other states in the region to allow U.S. forces the access and support they would need to defeat a nuclear-armed adversary? Neighboring states vulnerable to

[6] Scott D. Sagan, "The Perils of Proliferation: Organization Theory, Deterrence Theory, and the Spread of Nuclear Weapons," *International Security*, Vol. 18, No. 4, 1994.

the adversary's conventional military forces or nuclear capabilities might be susceptible to enemy coercion, which, if successful, could hamper U.S. military operations and undermine the United States' position as a security guarantor. To secure their cooperation, U.S. leaders will need to reassure these states that the United States can and will defend them from the adversary's conventional forces and, to the extent possible, its nuclear capabilities. U.S. leaders will also need to develop strategies to deter the adversary from attacking these states. In essence, the United States will need to extend a deterrent umbrella over its regional partners. Given the improbability of being able to develop and posture leak-proof defenses against all of the ways an adversary could employ nuclear weapons against U.S. forces and other targets in the region, how can the United States make its extended deterrence credible in the eyes of both the adversary and U.S. regional partners?

Persuading Other Powerful Actors to Exercise Restraint

How can the United States persuade other powerful states that feel threatened by a nuclear-armed regional adversary that they should not act independently in ways that could escalate a confrontation or conflict? In several regions in which the United States might have to confront an emerging nuclear power, other states have considerable conventional military capabilities. Some of them also have nuclear weapons, and others could develop or acquire them in a short time if sufficiently threatened by a historical enemy with emergent nuclear capabilities. In the event of a U.S. confrontation with a nuclear-armed opponent in one of these regions, the United States would want to persuade these states to accept U.S. crisis leadership to avoid the escalation that would likely result from them launching independent attacks on the adversary. But restraining their actions could be difficult if these states do not share U.S. interests and objectives or if they harbor doubts about whether the United States possesses the ability and resolve to protect them.

Efforts to reassure these states might include providing them defenses and guarantees of U.S. extended deterrence and threatening the adversary accordingly. However, offering such reassurances to powerful states suffers the same credibility challenges as does offering them to vulnerable states. Moreover, taking such steps could risk escalating the crisis or conflict by encouraging the defended state to act belligerently, believing itself to be under U.S. protection, or by suggesting to the adversary that the United States is building a powerful coalition against it in preparation for regime change.

Restoring Deterrence

Should the adversary cross the nuclear threshold in some way, how can the United States restore deterrence, both during the conflict at hand and afterward? Should such an event occur, U.S. leaders would want to respond in ways that deter further nuclear use and punish enemy leaders for their transgression. But how could they do so without escalating the conflict even further? Should the United States respond to a nuclear attack in kind, or should it rely instead on its conventional superiority to disarm the adversary and inflict punishment or remove the regime

from power? Current U.S. policies seek to reduce the salience of nuclear weapons in international discourse, so U.S. leaders might prefer to avoid their use.[7] But could the United States rely on conventional force alone to disable or destroy an opponent's nuclear weapons before it could use more of them on regional targets? And if other states see this adversary employ nuclear weapons in defiance of U.S. deterrent threats and not receive a prompt and devastating response in return, what does that portend for the future of the nuclear arms control regime?

Deciding Whether to Attempt Neutralization

Should the United States find itself in a military confrontation with a regional adversary armed with emergent nuclear capabilities, U.S. leaders would likely want to neutralize that threat if possible, thereby freeing U.S. forces to exploit their conventional warfighting superiority. Ideally, neutralization could be achieved via defensive measures alone; however, as previously mentioned, this is unlikely, given missile defense limitations and risks that the adversary could deliver one or more weapons via other means, such as covert insertion. Therefore, any neutralization operation would have to rely primarily on offensive actions, with defensive measures in place for added security in case the preventive or preemptive attacks failed to destroy or capture all of the enemy's nuclear weapons.[8]

Attacking the adversary's nuclear capabilities would pose serious risks. Leaders of nuclear-armed states likely to find themselves in confrontation with the United States will have acquired nuclear weapons largely to offset superior U.S. conventional capabilities and ensure their survival against regime change.[9] Any U.S. effort to neutralize these capabilities, particularly via offensive actions, would be perceived as an effort to clear the way for a U.S. operation to destroy their military capabilities and remove them from power. Even setting preparations for such an attack in motion, such as conducting cyberattacks against nuclear-related targets or accelerating the movement of counterforce assets to the region, could generate incentives for opponents to hide their weapons or use one or more of them before they are destroyed. Consequently, any U.S. decision regarding an effort to capture, disable, or destroy a regional adversary's nuclear arsenal

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[7] See Executive Office of the President, *National Security Strategy*, Washington, D.C.: White House, May 2010, pp. 23–24; U.S. Department of Defense, *Nuclear Posture Review*, Washington, D.C., April 2010, pp. 15–17; U.S. Joint Chiefs of Staff, *The National Military Strategy of the United States of America: Redefining America's Military Leadership*, Washington, D.C., February 2011, p. 7; and William J. Perry and James R. Schlesinger, *America's Strategic Posture: The Final Report of the Congressional Commission on the Strategic Posture of the United States*, Washington, D.C.: United States Institute of Peace Press, 2009.

[8] *Preemptive attacks* are those launched when facing an imminent threat of enemy attack. One preempts in the belief that the enemy is about to attack and that striking first would be better than allowing the enemy to do so. *Preventive attacks*, on the other hand, are those launched in response to less immediate threats, when one believes the enemy is developing dangerous capabilities that could shift the balance of power and concludes that attacking now would be better than attacking later. For a more detailed explanation of these concepts and an in-depth discussion of their strategic, political, and legal implications, see Mueller et al., 2006.

[9] Ochmanek and Schwartz, 2008, pp. 15–17.

must carefully weigh the operation's projected value against the risk that some number of weapons might survive and be launched before the operation is complete.

Whether U.S. leaders would be willing to take such risks would depend on four things:

1. the availability of actionable intelligence on the precise size, location, level of survivability, and command and control (C2) characteristics of the opponent's arsenal
2. the degree of confidence U.S. leaders could place in their forces' ability to capture or destroy the adversary's weapons before any are delivered to friendly targets
3. the degree of confidence U.S. leaders could place in their forces' ability to effectively defend against whatever retaliatory strikes the adversary might launch with any nuclear capabilities that survive U.S. attacks
4. whether they are convinced the adversary is about to use nuclear weapons to harm people—i.e., by striking occupied targets or deliberately creating harmful radiation effects, versus simply conducting a demonstrative test—even if the United States does not attempt to disarm them.

These considerations bring sharper focus to one of the principal research questions this analysis seeks to answer: Under what circumstances, if any, the United States would be able to neutralize a regional opponent's nuclear capabilities? It further raises questions about whether there is some threshold of nuclear maturity beneath which U.S. forces could safely launch a preemptive strike disarming the opponent in a crisis or war and what kinds of capabilities U.S. forces would need to generate sufficient probabilities of success to make such operations viable. We shall endeavor to answer these critical questions in Chapter Three.

3. Assessing the Neutralization Options

In March 2013, in a joint press conference with Israeli Prime Minister Benjamin Netanyahu, President Barak Obama repeated a statement that U.S. officials have made on multiple occasions over the past several years: "All options are on the table in dealing with Iran." Prime Minister Netanyahu added, "Iran is a grave threat to Israel, a grave threat to the world," and "Israel has a right to independently defend itself against any threat, including an Iranian threat."[1] While such statements are made in the context of preventing Iran from developing nuclear weapons, one might presume they would also apply were the United States or Israel to discover that Iran had already crossed that threshold to become an emergent regional nuclear power. Should the United States find itself in a military confrontation with a nuclear-armed Iran or any other future emergent nuclear-armed regional adversary—a situation quite possible given the threats that U.S. and Israeli leaders have often issued in efforts to reassure their publics and discourage Tehran from pursuing such capabilities—U.S. military leaders would need to know whether and how they could preemptively destroy the adversary's nuclear weapons, or deny their effective use, in order to free U.S. and allied forces to exploit their conventional warfighting superiority.

Recent scholarship has suggested that advances in precision guidance systems and reconnaissance technologies have dramatically improved U.S. nuclear and conventional capabilities, effecting a "counterforce revolution" of such magnitude that the United States may soon be able to conduct a disarming first strike on even a major nuclear power such as Russia.[2] If that is the case, the United States ought to be able to disarm an emergent nuclear-armed regional adversary with ease, at least with a surprise first strike in peacetime. The question relevant to this study, however, is whether it could do so in a crisis.

This chapter examines whether and how U.S. forces might be able to neutralize a regional adversary's ability to strike with nuclear weapons. The first step in such an assessment is to identify the range of options an adversary would have for employing, hiding, or moving its nuclear weapons when in a confrontation with the United States. The analysis that follows is performed in two of the three dimensions of the framework laid out in Chapter One: We examine each side's options at three levels of opponent nuclear development and at three levels of

[1] "All Options Are on the Table with Iran," *CBS DC*, March 20, 2013.

[2] See Keir A. Lieber and Daryl G. Press, "The Rise of U.S. Nuclear Primacy," *Foreign Affairs*, Vol. 85, No. 2, March /April 2006, pp. 42–54; Keir A. Lieber and Daryl G. Press, "The End of MAD? The Nuclear Dimension of U.S. Primacy," *International Security*, Vol. 30, No. 4, Spring 2006, pp. 7–44; Keir A. Lieber and Daryl G. Press, "The New Era of Nuclear Weapons, Deterrence, and Conflict," *Strategic Studies Quarterly*, Spring 2013, pp. 3–14.

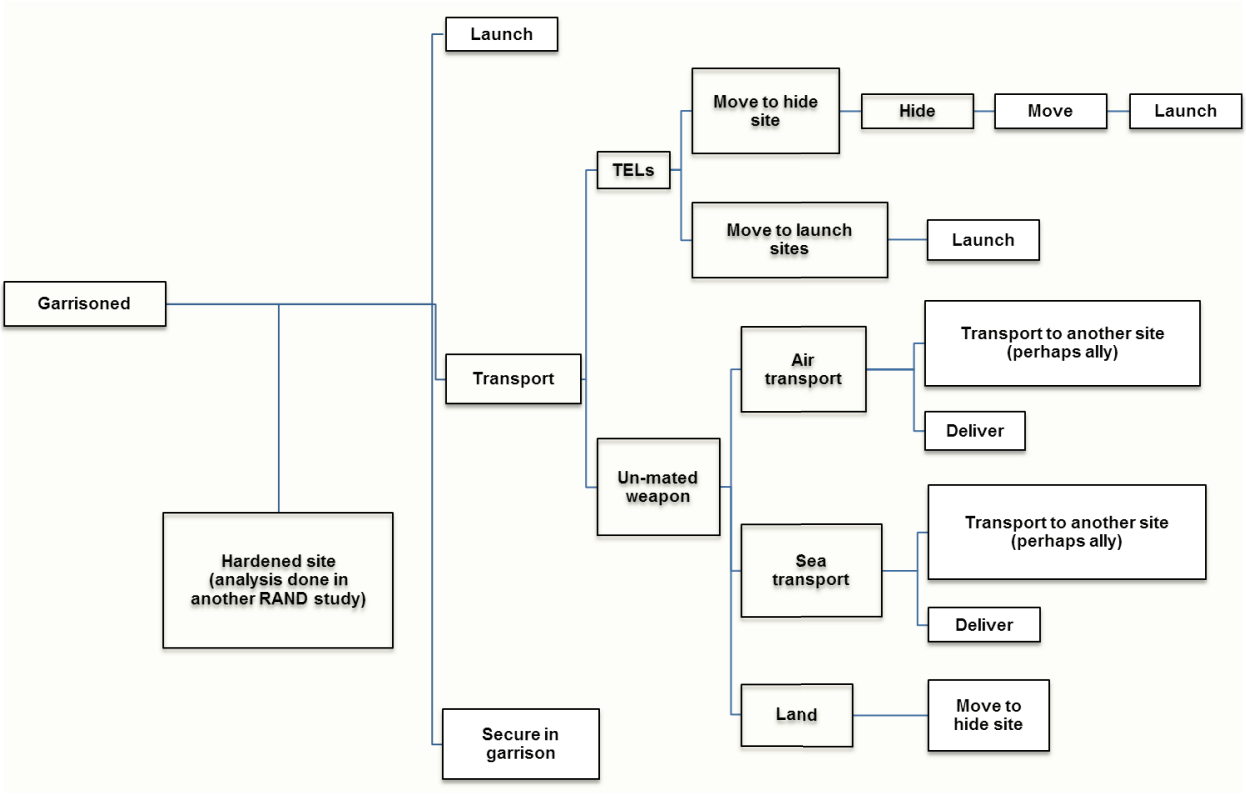
conflict.[3] The ultimate goal of this chapter is to identify a probable breakpoint in the viability of neutralization strategies—that is, determine the conditions in which it might be possible to neutralize an opponent's nuclear capabilities, as opposed to those in which it probably would not be possible—in order to inform U.S. decisionmaking in a crisis or conflict with a nuclear-armed regional adversary.

The Adversary's Range of Options

Once a regional adversary has developed or otherwise obtained nuclear weapons, there are a variety of things it might do with those weapons when confronted by the United States. What options are available to it would depend on its geographical circumstance—the size and terrain of its territory, whether it is landlocked, how close its potential enemies are, the extent of their territories, etc.—and what capabilities it has to deliver its weapons. One of the most important of these capabilities is the ability to employ the weapon on a ballistic missile. Other aspects that are important are whether the weapons are already mated to ballistic missiles or stored separately and whether the missile system is mobile. Nuclear weapons coupled with ballistic missiles present a serious and immediate threat to potential military and civilian targets anywhere within the range of those missiles. Because a country with these capabilities would present the most challenging case, we can assume it would also have other means of delivery, such as airdrop or covert insertion. To better understand this potential range of options, we developed the flow chart in Figure 3.1 to show the different ways a nuclear-armed regional adversary might move, hide, or employ its weapons in a confrontation with the United States.

[3] Regional geography also plays a role in shaping U.S. opportunities to preempt or defeat attacks; however, we found both sides' options to be approximately the same in each of the three geostrategic challenges, so we need not explicitly address that dimension of analysis here.

Figure 3.1. Potential Nuclear-Armed Regional Adversary Courses of Action



The analysis illustrated in Figure 3.1 assumes that the weapons would be in garrison at the onset of a confrontation and considers what courses of action the adversary would have available to it regarding them. The garrison might be a soft, above-ground facility, or it could be a hardened facility or perhaps tunnels in a mountain.[4] When a crisis occurs, the adversary could decide to launch the weapons directly from garrison, secure them there, or transport them elsewhere. If the garrison were not a hardened site, striking them there would present the least challenging situation for a U.S. neutralization effort. Therefore, it is unlikely that the adversary would leave them there as tensions escalate.

A more likely adversary course of action would be to flush the weapons out of garrison in an attempt to enhance their survivability. Among the questions U.S. forces would need to answer at this point is whether the weapons are mated to missiles or being transported by other means. If the weapons are mated to missiles and being moved on transporter-erector-launchers (TELs), they might either be going to launch sites or hide sites. Although this is a stylized description, in that launch and hide sites are not mutually exclusive, it does identify the scope of the potential challenges once the TELs have left the garrison. In either case, once the weapons are mated and on TELS, a launch could occur fairly quickly.

[4] Because analysis of U.S. capabilities to neutralize weapons in hardened facilities was the focus of a separate RAND research project, we do not pursue that question further in this document.

Another possibility is that the adversary will attempt to preserve its arsenal or deliver it by other means.[5] In the case when the weapons are not mated to TELs, transport by air, sea, and land is a possibility. In all cases, the opponent may be seeking to preserve its capability by moving the weapons to another site—perhaps a hide site or an allied country—or deliver them by means other than ballistic missiles. In the case of air and sea transport, this could also be used as a delivery method. For example, weapons being transported by sea could be headed to an adversary's port or canal for detonation. Air transport could also provide the means to quickly deliver the weapon to a location for detonation. Transport by land could also be viewed as a delivery mechanism, although the number of potential targets would be limited to those that share a land border with the adversary. Land borders would likely be heavily monitored, making it difficult to be confident that the weapon could actually be delivered.

Given this range of potential options available to a nuclear-armed adversary in a crisis, we can explore approaches U.S. forces might use to neutralize those weapons. As the analysis will illustrate, the United States would need to employ different capabilities depending on how developed an adversary's nuclear capabilities are and what course of action its leaders decide to take.

Potential Ways to Neutralize an Adversary's Nuclear Capabilities

Many factors must be considered when assessing the viability of potential U.S. options to neutralize a regional adversary's nuclear capabilities. However, the most important considerations can be grouped into categories consistent with two dimensions of our analytical framework: the level of the adversary's nuclear development, and the level of conflict. Comparing these two categories, the first relates most directly to whether a U.S. effort to neutralize an adversary's nuclear capabilities would be viable and how it would need to be done. Therefore, we organize this phase of the analysis by level of adversary nuclear development, then discuss how U.S. and adversary behaviors might change at each level should a confrontation escalate from crisis to conventional war and then across the nuclear threshold.

Neutralizing an Adversary's Initial Capabilities

A regional adversary is most vulnerable to U.S. efforts to neutralize its nuclear capabilities when it has just developed or otherwise acquired its first handful of weapons. For the purposes of our analysis, we define this *Initial Capability* as about three weapons, not mated to ballistic missiles. In this condition, regime leaders would be very concerned about the security of their highly valuable, but relatively vulnerable, assets. During peacetime, they would likely store them in a well-guarded central location to protect them from internal security threats. This storage facility

[5] The adversary could also be trying to preserve its weapons when mated on TELs and headed to hide sites. We focus this portion of the analysis on nonmated weapons, since they are easier to hide and transport can be more easily disguised. But the same analysis would hold for mated weapons.

might be above ground if the regime acquired the weapons from an external source. However, if it developed the weapons domestically, as would likely be the case, regime leaders would have had to worry about the threat of preventive military strikes and might have dispersed, hidden, and hardened much of the development infrastructure. In such circumstances, they would likely have built a hardened storage facility to house the weapons even before they were available.

Neutralization During a Crisis

Depending on the degree of hardening of the storage facility, given reliable intelligence on the location of a small, centrally located nuclear arsenal, U.S. forces might have sufficient strike capabilities to destroy it. If so, one might assume that this would allow the United States to execute a sudden preventive or preemptive strike with a high probability of success in a crisis, but that might not be the case. U.S. leaders would be unlikely to authorize such a provocative act early in a confrontation, while there still appeared to be a reasonable chance of avoiding war. Later, were the crisis to intensify, regime leaders would eventually become more afraid of a U.S. disarming strike than they were of internal security threats, particularly once the United States began posturing forces in the region. Then they would disperse their nuclear weapons, reducing the chances of a successful U.S. disarming strike. Yet a sudden disarming strike would not be the United States' only option should the crisis escalate to war.

Neutralization During a Conventional Conflict

Once a conventional conflict has begun, U.S. leaders might choose to pursue a conventional neutralization campaign. Such a course of action would need to include both defensive and offensive measures. Joint forces would have to make every possible effort to seal off the country to defeat enemy efforts to deliver nuclear weapons or move them elsewhere by air, land, or sea. A multi-domain blockade might be an option—U.S. forces could implement a no-fly zone and a naval blockade, and they might persuade neighboring countries to close any contiguous borders. Assuming the adversary's ability to deliver or move its nuclear weapons could be neutralized in this manner, U.S. forces could then begin to disarm it. A suppression of enemy air defenses (SEAD) campaign could be implemented, which would allow the United States to fly intelligence, surveillance, and reconnaissance (ISR) missions and strike sorties over the country. U.S. conventional airpower would dismember the adversary's integrated air defense system (IADS) and strike all targets known or suspected to be associated with nuclear weapons production, storage, transshipment, and delivery. The enemy's conventional forces, infrastructure, C2, and leadership could all be engaged.

In a situation such as this one, in which the regime could not launch or move the weapons by air, land, or sea, the conflict would resemble one with nonnuclear regional actor. U.S. forces would have the time needed to find and engage the weapons and could control the tempo of the conflict. The regime would have limited means to strike at U.S. interests. The ultimate objective of such a campaign would likely be regime change, because U.S. leaders could not risk

embarking on a neutralization effort without confirming in the end that all of the adversary's nuclear weapons had been destroyed or captured, lest the regime use one later, or transfer it to a third party for use, against U.S. interests in revenge.

The chances of successfully neutralizing a nuclear-armed adversary's initial capabilities in such a campaign would largely depend on geography and the correlation of forces. A small, weak, island nation would be much easier to seal off and dominate than a large country with land borders and rugged terrain, particularly if the neighbors on any of its borders were unfriendly with the United States and sympathetic with the regime. In any event, neutralization would be a risky strategy, even against a weak adversary. U.S. efforts to capture or destroy a regime's nuclear deterrent capabilities would confirm its leaders' worst fears—that they had been targeted for regime change. That would almost certainly convince them that they were fighting for their lives and put them in a use-or-lose dilemma regarding their nuclear weapons.

Neutralization After Nuclear Use

A conventional conflict with a regional adversary could cross the nuclear threshold, either as the result of a failed U.S. neutralization strategy or simply due to uncontrolled escalation. Should the adversary manage to employ one or more nuclear weapons—an opponent with only a handful of weapons would probably use only one, keeping the others in reserve to hold additional targets at risk—U.S. leaders might have no alternative but to continue (or shift to) a neutralization strategy and fight on to regime change, whatever the costs. As we shall discuss below, to do otherwise would undermine the credibility of future deterrent threats and the continued viability of the nuclear arms control regime. Whether the United States could accomplish those tasks with conventional efforts alone or would need to employ its own nuclear weapons would depend on geography, the correlation of forces, and available intelligence about the adversary's remaining capabilities.

Neutralizing an Adversary's Nuclear-Armed Ballistic Missile Capabilities

The second and third levels of analysis in the nuclear development dimension of our analytical framework involved looking at neutralization prospects when the adversary has *A Few MRBMs*, which we define as about a dozen nuclear weapons with some of them mated to MRBMs, and when it has *MRBMs and IRBMs*, which we define as between one dozen and two dozen nuclear weapons with some of them mated to IRBMs in addition to those on MRBMs.

As mentioned earlier, efforts to neutralize a regional adversary's nuclear capabilities become much more challenging when it has capabilities for delivering nuclear weapons via ballistic missiles. Ballistic missiles provide the regime an ability to immediately threaten or strike a wide range of regional targets and, depending on the adversary's location and the range of the weapons, potentially the United States itself. Timelines from launch to weapon detonation would be very short, giving U.S. forces limited time to react. The greater the number of ballistic missiles available to the adversary and the longer their range, the more difficult it would be for

U.S. leaders to manage the situation. Yet the prospects of successful neutralization are grim even when the adversary has only a few MRBMs, and considerations for whether U.S. leaders should attempt such a strategy are similar whether the adversary has only a few MRBMs or several and IRBMs as well. Therefore, we combine these levels of analysis into one section for discussion.

Neutralization During a Crisis

As was the case when confronting an adversary with only an initial nuclear capability, the time to conduct a sudden disarming strike with the highest probability of success would be before the crisis heats up, while most, perhaps all, of the nuclear-armed missiles are clustered in their peacetime garrisons and any unmated weapons are centrally stored. But once again, U.S. leaders would be unlikely to authorize such a strike before tensions rise, and, as the crisis escalates, regime leaders would probably flush the missiles out of garrisons on TELs before U.S. forces could get into position to execute a conventional preemptive strike. Moreover, even were U.S. leaders to authorize a preemptive strike on missile garrisons, if they were located in mountain tunnels or other deeply buried, hardened facilities, open-source analyses suggest that U.S. forces would not be able to destroy them with conventional weapons.[6]

Once out of garrison, TELs would be very difficult to find, track, and target. Terrain and foliage present challenges for ISR assets. Picking TELs out from other traffic on the roadways could also be a problem. Further, TELs could be moved to hide sites, such as warehouses, overpasses, tunnels, jungle with camouflage, and other locations. If these movements were not detected and identified while en route, the TELs would be difficult to find using airborne assets. In sum, U.S. leaders could never be certain they could find and destroy all the TELs before any nuclear weapons are launched.

Ballistic missile defense (BMD) systems could provide some protection against the missiles missed in a preemptive strike, but probably would not give U.S. leaders enough confidence to authorize such a gamble, no matter how capable or robust system developers or operators profess them to be.[7] One could envision a BMD system achieving a very high probability-of-kill (P_K) in testing during research and development and even in operational testing. But high scores in controlled tests do not translate to comparable results in combat against an adaptive adversary.[8]

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[6] Christopher Ford, "Conventional 'Replacement' of Nuclear Weapons?" remarks delivered on at the Conventional Deterrence in the Second Nuclear Age conference, sponsored by the Carnegie Endowment for International Peace, November 17, 2010; Bruno Tertrais, "In Defense of Deterrence: The Relevance, Morality, and Cost Effectiveness of Nuclear Weapons," Paris: Institut Français des Relations Internationales Security Studies Center, *Proliferation Papers,* No. 39, Fall 2011.

[7] Samaan and Lasconjarias, 2013.

[8] For instance, the AIM-7 Sparrow air-to-air missile achieved a P_K of 0.80–0.90 in testing during research and development and 0.50–0.60 in operational testing, but it achieved a kill rate of just 0.08–0.10 in combat over Vietnam. Similar disparities between P_Ks recorded in testing and actual combat results were noted with AIM-7s, AIM-9s, and AIM-120s in Kosovo and both Gulf Wars. See "Air-to-Air Weapons Effectiveness," *Defense Issues*, June 15, 2013; "AIM-7 Sparrow," *Jane's Air Launched Weapons*, IHS, May 12, 2015; "AIM-9 Sidewinder," *Jane's Air Launched Weapons*, IHS, September 26, 2014.

And even if military commanders believed they could get as many as half of an opponent's 10 or 20 dispersed TELs in a surprise strike before they could launch, trusting BMD to intercept the rest, a system with a P_K as high as 0.90 would still bear a substantial risk of allowing at least one missile to get through and potentially kill thousands of people in a regional city. In sum, the United States would have little chance of being able to successfully preempt a nuclear-armed adversary with a sudden strike once its weapons are mated to ballistic missiles and able to move on TELs. Similarly, U.S. forces would probably not be able to posture sufficiently robust and capable BMD assets to adequately defend regional targets from the missiles that an adversary might launch in response to such a strike. As a result, there is little chance any leader would allow U.S. forces to attempt neutralization during a crisis.[9]

Neutralization During a Conventional Conflict

When facing a regional adversary that has nuclear-armed ballistic missiles on mobile TELs, U.S. forces would probably not have any more neutralization options during a conventional conflict than it did during the crisis. The adversary's TELs would surely now be fully deployed to hide sites and launch sites (some of which would doubtless be the same), and U.S. BMD systems would still be unable to provide sufficient protection against a potential enemy reprisal to convince U.S. leaders to authorize a preemptive strike.

Moreover, unlike when facing an opponent with only an initial nuclear capability, U.S. forces would be unable to conduct an extended neutralization campaign without escalating the conflict across the nuclear threshold. Although U.S. forces might be able to blockade the regime's borders, reducing its ability to move nuclear weapons out of the country, the challenges noted above and the disappointing results obtained in efforts to find and destroy mobile TELs in previous wars indicate that efforts to find and destroy the adversary's dispersed nuclear weapons would probably be ineffective. Worse, were it to start being effective, it would put regime leaders in a use-or-lose dilemma, pushing them toward and potentially over the nuclear threshold. In fact, even efforts to gain the degree of air superiority needed to prosecute such a campaign would signal enemy leaders that the United States was attempting to disarm them in preparation for regime change. That alone might be enough to push them over the brink.

Given these daunting challenges, it is highly unlikely that U.S. leaders would authorize efforts to disarm a regional adversary in possession of even only a few nuclear-armed MRBMs.

Neutralization After Nuclear Use

As the foregoing considerations indicate, there are significant risks that a regional adversary with nuclear-armed ballistic missiles would use one or more of those weapons against U.S. forces or regional cities should the United States attempt to neutralize its capabilities and fail, or even

[9] For a more detailed mathematical analysis that reaches the same conclusion, see Dean A. Wilkening, "A Simple Model for Calculating Ballistic Missile Defense Effectiveness," *Science and Global Security*, Vol. 8, No. 2, 1999, pp. 183–215.

were regime leaders to conclude that a U.S. effort to do so is imminent.[10] Such a catastrophe would create two of the dilemmas for U.S. leaders identified in Chapter Two—whether to attempt to neutralize the opponent's remaining nuclear capabilities, and how to restore deterrence after such a catastrophic breakdown. As we shall explain below, the answer to the second question essentially forces an answer to the first one: To restore credibility to future nuclear deterrent threats, the United States would have to respond to an adversary's nuclear attack in a decisive way—it would have to neutralize the adversary's remaining nuclear capabilities and remove the regime.[11] But how might U.S. forces do that?

As previously discussed, current U.S. policies seek to reduce the salience of nuclear weapons in international discourse. With that in mind, some analysts have argued that, given the asymmetric strength of U.S. conventional forces and the dramatic effects they can now create with precision-guided munitions (PGMs) and high-yield conventional weapons, those capabilities constitute powerful deterrent threats and their use could replace the use of nuclear weapons in the event of a nuclear deterrence failure.[12] While the first of these claims has some merit—the risk that the United States will bring its conventional superiority to bear in major combat operations is one that potential adversaries must always weigh in their decision calculations—the second is dubious. Replacing nuclear counterstrikes with conventional ones might be possible if U.S. conventional capabilities could be brought to bear with sufficient speed, simultaneity, and destructive force to disarm an adversary, or at least assure substantial damage limitation, before it could launch more weapons. But it is hard to see how this could be done against any but the feeblest and most vulnerable of emergent nuclear states, i.e., one with very few nuclear weapons stored in soft facilities in known locations and with no ability to deliver them quickly. As explained above, if the adversary's nuclear weapons are mated to ballistic missiles and dispersed, it would be highly unlikely that U.S. forces could locate and destroy them with conventional weapons before more are fired, much less build up sufficient forces in the region to conduct a campaign for regime change. The adversary could hold additional targets at risk to deter these actions, potentially escalating to strikes on regional cities, or hitting additional cities if it has already done so.

One might argue that U.S. leaders could choose a more patient approach in response to an enemy nuclear strike, terminating the immediate conflict then launching a surprise conventional disarming strike followed by a campaign for regime change some months or years later, after the

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[10] The adversary might also use nuclear weapons in a somewhat less provocative way, such as to destroy space assets or generate EMP effects, without injuring people directly. As those actions might call for some U.S. response less dramatic than neutralization and regime change, we shall discuss them in Chapter Four.

[11] This would also be necessary for the nuclear arms control regime to remain viable.

[12] Michael S. Gerson, "Conventional Deterrence in the Second Nuclear Age," *Parameters,* Autumn 2009; Elaine Grossman, "Debate Heats Up Over Conventional, Nuclear Deterrence Tradeoffs," *Global Security Newswire,* March 19, 2010.

enemy is lulled into a false sense of security.[13] But aside from the obvious questions as to why the enemy would ever let down its guard after such an act and how delaying the response to a later date would change the fundamental problem, such a course of action would undermine the credibility of future U.S. deterrent threats and challenge the continued viability of the nuclear arms control regime. Other governments hostile to the United States would see this regime survive after using nuclear weapons to destroy property or kill people (perhaps tens of thousands of them) in defiance of U.S. deterrent threats. In disengaging from the fight, the United States would appear cowed. Not only would this remove any doubt that the possession of nuclear weapons constitutes the ultimate insurance policy against regime change, it would undermine future deterrent threats and suggest that having these capabilities offers wider latitude for risk taking to change the status quo. Nuclear proliferation would almost certainly accelerate as a result, and incidents of regional aggression might become more frequent.

To forestall these developments, the United States would need to respond to a serious breach of the nuclear taboo with a swift and dramatic reprisal. Given the inability of conventional weapons to strike with sufficient speed and simultaneity to minimize the risk of additional enemy nuclear strikes, the counterstrike would have to be done with nuclear weapons. Moreover, proportionality would have to be a secondary concern in such a reprisal. U.S. leaders could not answer an opponent's nuclear strike on a military force concentration, for instance, with a single nuclear counterstrike on a comparable target, and risk the adversary then striking a city in an escalating game of tit-for-tat. Rather, once U.S. leaders were to conclude that a nuclear strike is necessary, U.S. forces would need to launch enough weapons to simultaneously extinguish the enemy regime and destroy as much of its nuclear capabilities as possible before they could do further damage.

Such a turn of events would constitute an international catastrophe of immense proportion—which is, of course, why escalation management in confrontations with nuclear-armed regional adversaries is so important—but for future U.S. deterrent threats to have credibility and the nuclear nonproliferation regime to remain viable in the Second Nuclear Age, the world would have to see any regional adversary that resorts to the definitive use of nuclear weapons in war promptly and dramatically destroyed.

Concluding Observations

Findings of the parametric analysis suggest that an identifiable breakpoint exists in the viability of strategies for disarming nuclear-armed regional adversaries. That breakpoint is the adversary's possession of nuclear-armed ballistic missiles. U.S. forces might be able to disarm emergent nuclear powers that possess only a handful of weapons not mated to ballistic missiles, but once the adversary has even a few nuclear-armed missiles on mobile TELs, the challenge of finding

[13] This was a strategy that participants proposed in one of the map exercises this research project conducted to explore this challenge.

and destroying all of them before any are launched is daunting. As a result, U.S. leaders would be unlikely to authorize military forces to attempt such a strategy except in the direst of circumstances: after the adversary has used nuclear weapons against U.S. forces or a regional target, or, perhaps, when reliable sources indicate that such a strike is imminent.

A major impediment to finding and destroying mobile TELs is the fact that any state that is militarily advanced enough to have nuclear-armed ballistic missiles would probably also have an advanced IADS, so U.S. airpower would not have free access to its airspace to search for the TELs or strike them once found. U.S. forces are capable of suppressing enemy air defenses, but doing so takes time. A SEAD campaign would signal enemy leaders that U.S. forces are preparing to attack their nuclear forces and other targets upon which they and the regime depend for survival. This would create a use-or-lose dilemma for regime leaders, with strong incentives for them to employ one or more weapons in efforts to compel the United States to stop the campaign and cancel any further plans to disarm them. Even were U.S. forces to manage to locate all TELs and other nuclear weapons storage locations and deployment sites with a high level of confidence, it would be difficult to strike with sufficient simultaneity to destroy all of them, before any are launched or moved.

The neutralization challenge would not be nearly so demanding were the United States to confront an adversary with only a handful of nuclear weapons not mated to ballistic missiles. In that case, at least theoretically, joint forces could blockade all air and sea routes of egress, denying the adversary the ability to deliver weapons to targets, and neighbors could close contiguous borders, effectively sealing off the regime from the rest of the world. With the adversary's meager nuclear capability effectively contained, U.S. airpower could then methodically dismember the IADS and begin striking all known nuclear weapon–related facilities and other targets, preparing the ground for regime change.

Even a campaign of this nature, however, would entail considerable risk. Few if any current or potential nuclear-armed regional powers have borders that could be effectively sealed. States such as North Korea, Iran, Syria, Pakistan, and even Venezuela have long coastlines, borders with rugged terrain, or both, and most have neighbors that probably would not cooperate with U.S. efforts to interdict all traffic across their common border. It might also be difficult to obtain reliable intelligence on where the regime has stored its nuclear weapons, particularly if regime leaders disperse them to separate hiding places when the crisis heats up. As a result, there might be opportunities for the regime to move weapons across borders during an air campaign, potentially transferring them to even more dangerous actors. Regime leaders could also hide them in their own country for later employment against U.S. or coalition ground forces when they arrive, or even use them against dissident elements of their own populace. According to one

study, "Most likely the residual nuclear arsenal would be used via hidden atomic demolition munitions, suicide vehicles, or short-range rockets from hidden and mobile launchers."[14]

Given these considerations, U.S. leaders would likely not try to disarm a nuclear-armed regional adversary at any level of development in most confrontations. However, there are circumstances in which a disarming strike or a neutralization campaign might emerge as the least bad option. Once a regime has used nuclear weapons to harm people inside or outside its territory, U.S. leaders might conclude they have no alternative but to pay whatever costs are necessary to disarm and remove it. Even if the adversary has not yet employed nuclear weapons, were reliable intelligence to indicate it is about to do so, U.S. leaders might conclude that a preemptive strike is unavoidable in order to limit the enemy's ability to inflict damage on U.S. forces or friends in the region.[15]

Such operations would be very risking and probably result in enormous costs, not only for U.S. and enemy forces, but also for noncombatants in the adversary's country and other countries in the region. Therefore, given the probability that the United States will one day need to confront nuclear-armed regional adversaries, it is important to find ways to protect U.S. interests in such confrontations without driving opponents to the nuclear threshold. To do that, U.S. leaders will need a framework for managing escalation in the Second Nuclear Age. In Chapter Four, we elaborate such a framework and use it to establish guidelines for developing escalation management strategies.

[14] Wilson and Colby, 2008, p. 43. An opponent with the initial capability we posited for our analysis probably would not have the ability to mate the weapons with short-range rockets, but that would still leave the demolition munitions and suicide vehicles with which to contend.

[15] As we shall explain in Chapter Five, however, U.S. leaders probably would not authorize a preemptive attack even were reliable sources to indicate an adversary is about to attack with nuclear weapons.

4. Managing Escalation in Crisis and War

As the analysis in Chapter Three indicated, there are few if any circumstances in which U.S. leaders would feel sufficiently confident in their military capabilities to allow U.S. forces to attempt to disarm a nuclear-armed adversary. Despite this constraint, should such a state threaten U.S. interests or regional friends, the United States would have to confront it and, if necessary, defeat its forces in conventional war. This would require U.S. leaders to posture and employ military forces in ways that achieve objectives while keeping the intensity and scope of conflict within acceptable limits.

This chapter offers guidance for managing escalation in U.S. confrontations and conflicts with nuclear-armed regional adversaries. Although detailed operational plans cannot be developed outside the context of specific scenarios against specific adversaries, escalation management concerns in these scenarios would share common elements. By examining the characteristics of nuclear-armed regional adversaries across a range of scenarios and levels of confrontation and at varying levels of nuclear development through the lens of RAND's theoretical framework for escalation management, we can identify these elements and offer escalation management guidelines to inform operational planning in each of these situations.

Therefore, we begin with a brief description of *threshold management*, a logical framework RAND has developed for understanding and managing escalation dynamics in 21st century conflicts.[1] We then apply this framework in a parametric analysis to better understand how to manage escalation in confrontations and conflicts against nuclear-armed regional adversaries in three geostrategic challenges: a maritime confrontation, an aspiring hegemon's invasion of a neighboring state, and a compellence campaign against a nuclear-armed adversary's homeland.

The Principles of Threshold Management

Threshold management is a logical framework designed to explore escalation dynamics and inform ways to manage escalation risks. It focuses on understanding the nature of escalation thresholds and the mechanisms through which escalation manifests, and then crafting strategies to manipulate those mechanisms to keep the intensity and scope of conflict from exceeding thresholds that would be excessively costly to the United States. To explain the principles of threshold management, we briefly discuss the nature of thresholds and then describe the workings of escalation's three mechanisms: deliberate, inadvertent, and accidental. Finally, we

[1] RAND developed the threshold management framework in earlier research due to the inadequacy of Cold War–era escalation management concepts. See Appendix B for a brief review of Cold War approaches to escalation management and a discussion of their shortcomings. For the research that originated what later came to be described as *threshold management*, see Morgan et al., 2008.

discuss the importance of examining each actor's interests in order to understand the balance of opposing interests and recognize those that belligerents share.

The Nature of Escalation Thresholds

An escalation threshold is an identifiable point in the intensity or scope of events that when crossed is recognized by at least one of the belligerents as constituting a significant change in the nature of the conflict. Thresholds are ideational elements subject to differences in perception and interpretation from one person or group of persons to another, so they come in many forms. Some escalation thresholds are symmetrical, in that all parties to a conflict recognize them and tend to view them similarly. Examples might include being the first to initiate hostilities in a crisis or employ nuclear weapons in a war. But some thresholds that are important to one actor may seem trivial or even be invisible to another. This subjectivity is one of the reasons why escalation is sometimes difficult to recognize, control, manage, and exploit.[2]

The subjective nature of thresholds creates serious risks of misperception and miscalculation. If one party knows that another considers a particular threshold to be important, that threshold is likely to be significant in its own eyes as well. But the adversary's perspective is not always well known or understood, nor is it always clear whether the enemy knows where one's own thresholds lie or what importance one places on those thresholds. Thresholds that emerge during a conflict are the most difficult to anticipate, as they typically arise in response to events not considered before they occur, or capabilities that did not seem so threatening before they were employed. In general, the thresholds that will be the easiest to anticipate are those that are geographically prominent—such as a river recognized as the boundary of one's territory—or those involving strongly held international norms, such as the taboos against the use of nuclear, chemical, and biological weapons. National policies firmly established before a crisis or conflict arises can also offer signposts regarding what actions an opponent might consider escalatory in war.

Given these uncertainties, the essence of threshold management is, to the greatest extent possible, to identify each belligerent's escalation thresholds and manage the use of force to achieve one's military objectives without crossing the enemy's critical thresholds, while discouraging it from crossing one's own. To do these things, however, one must understand what a state's critical escalation thresholds are and anticipate where they might lie.

Critical Escalation Thresholds

A state's critical escalation thresholds are those most closely tied to its survival and related core interests. Crossing those thresholds would almost certainly prompt opposing leaders to escalate the fight, believing their survival or the survival of their regime to be at stake. If the adversary

[2] See Thomas C. Schelling, *Arms and Influence*, New Haven, Conn.: Yale University Press, 1966, pp. 153–168 and 283–286.

has nuclear weapons, that escalation could be dramatic. Given the vulnerabilities and sensitivities an emergent nuclear power is likely to exhibit, several courses of action and target sets that might otherwise be attractive to U.S. war planners should be treated with caution, as prosecuting them would likely cross critical escalation thresholds. Invading the enemy's homeland with any kind of ground force that resembles what the United States has historically used for regime change would almost certainly cross a critical threshold. Kinetic attacks on national leaders might also cross a critical threshold, because they would appear to constitute an effort to decapitate the enemy regime. Attacks on nuclear forces or their C2 networks would likely cross a critical threshold as well, because they could be interpreted as efforts to disarm the adversary's deterrent forces in preparation for regime change. Even efforts to disable or destroy the opponent's homeland IADS might violate a critical escalation threshold, in that they might be interpreted as preparing the way for attacks on opposing leaders or their nuclear deterrent capabilities.

Escalation Mechanisms and Motives

While attention to thresholds is necessary for managing escalation, that alone would not be enough in any confrontation or conflict, particularly were it to involve a nuclear-armed regional adversary. In managing such a confrontation, U.S. leaders would also need to understand the mechanisms through which escalation manifests and what might motivate belligerents to intensify or broaden the scope of their attacks, even when they want to keep the conflict limited. Escalation in confrontation and war occurs through three mechanisms: *deliberate*, *inadvertent*, and *accidental*. While these mechanisms are theoretically distinct, escalation in an actual conflict often results from the interaction of more than one of them at once, and escalation of one type can trigger escalation through one or both of the other mechanisms as well.

Deliberate Escalation

Deliberate escalation occurs when a party to a confrontation or conflict intentionally takes some action that it knows will cross one or more of an opponent's escalation thresholds. There might be any number of proximate motives for taking such action, but they can all be generally described as either *instrumental* or *suggestive* in nature, or some combination of both.

In instrumentally motivated escalation, an actor believes that increasing the intensity or scope of the fight will work to its advantage by helping it achieve victory or avoid defeat. A belligerent might broaden its list of bombing targets or begin using more destructive weapons to overwhelm an enemy's capacity to resist, or it might launch an attack in a region previously unthreatened to cut off the enemy's access to important resources or force it to divide its forces. Escalation of this type often prompts the opponent to try to match or surpass the increase in effort, or escalate in some other dimension to counter its adversary's perceived advantage.

Alternatively, in suggestively motivated escalation, a belligerent deliberately increases the intensity or scope of conflict in efforts to signal an opponent that it ought to change its behavior

in some way. This form of deliberate escalation is akin to the kind of coercive bargaining that Thomas Schelling described, in which an actor punishes its opponent not primarily for the direct military benefit that might result from such action, but to suggest that more punishment will come if the opponent does not comply with its demands.[3] The systematic firebombing of Japanese cities in 1945 offers an example of deliberate escalation for suggestive motives. It signaled Japanese leaders that until they complied with Allied demands for unconditional surrender, they could expect such horrendous costs to mount, day after day. The atomic bombings of Hiroshima and Nagasaki constituted another deliberate and dramatic escalation to reinforce that signal.[4]

Avoiding deliberate escalation is partly a matter of self-restraint. Leaders should resist the temptation to escalate a conflict in ways that might offer temporary tactical advantages at risk of suffering serious long-term strategic costs. But self-restraint in war can be exceedingly difficult. Moreover, containing deliberate escalation requires more than just self-restraint. As war is a struggle between two or more adversaries, one must also deter other actors from escalating the conflict by convincing them that doing so would not work to their advantage. Deterrence involves threatening to punish the opponent for some prospective escalation, orchestrating forces in a way that convinces it that the escalation would not be successful, or some combination of both approaches. The objective is to influence the opponent's decision calculus, leading enemy leaders to conclude that the costs of escalation would ultimately outweigh whatever benefit they might hope to gain from it.

Deterring a nuclear-armed regional adversary from deliberately escalating a conflict with the United States might involve issuing threats of counter-escalation. In some relatively easy cases, simply threatening to match the escalation symmetrically might be enough to deter it. The presence of a powerful bomber force, for instance, might be enough to deter an adversary from attacking regional cities with bombers or missiles. Similarly, the vulnerability of an enemy's heretofore-unmolested province might be enough to deter it from escalating a conflict into the territory of a U.S. regional partner not yet affected by the war. In more challenging cases, however, greater or different threats might be required to offset the advantages the enemy expects to gain by escalating.

Whether instrumental or suggestive, deliberate escalation is the mechanism most naturally associated with the metaphor of climbing a ladder. Therefore, it is what military and political

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[3] Schelling, 1966, p. 172.

[4] It is important to note that, while the atomic bombings represented a dramatic escalation in that they introduced a terrifying new weapon, they were not escalatory in terms of the levels of destruction or suffering they caused as compared with the firebombings. For instance, the March 9, 1945, firebombing of Tokyo inflicted 185,000 casualties in a single attack. In comparison, the combined casualty toll from the bombing of Hiroshima and Nagasaki was about 110,000 people killed, with an estimated 90,000 more people injured. See *United States Strategic Bombing Survey: Summary Report (Pacific War)*, Washington, D.C., 1946, reprinted as *The United States Strategic Bombing Surveys (European War), (Pacific War)*, Maxwell AFB, Ala.: Air University Press, 1987, pp. 92 and 100–101.

decisionmakers tend to envision when they think of escalation, leading them to assume they can control it. Unfortunately, escalation often gets out of control despite the best efforts of leaders on all sides to contain it. This is partly because not all escalation is deliberate in nature. Sometimes it occurs inadvertently or due to accident.

Inadvertent Escalation

Inadvertent escalation occurs when one belligerent deliberately undertakes an action that it does not consider escalatory, but the action is perceived as such by an opponent. In other words, the action crosses a threshold that is important to the adversary, but appears insignificant or is unknown to the escalator. Incidents of inadvertent escalation typically result from not anticipating how an opponent will view certain actions, either due to a lack of intelligence or simply not considering how the opponent's view of the conflict, and particularly its vulnerabilities, will likely affect its perception of thresholds. It can also result from an inability to anticipate the reactions of third parties who might be prompted to begin or increase their support to the opponent or even intervene in the conflict.[5]

Numerous cases of inadvertent escalation can be found in past confrontations and wars, such as the chain reaction of military mobilizations on the eve of World War I and MacArthur's 1950 drive into North Korea. Among the many insights these cases offer is that inadvertent escalation is difficult to deter because it occurs as a result of decisionmakers not understanding the degree to which the actions they are embarking upon are escalatory. Therefore, a straightforward approach to reducing the risk of inadvertent escalation in a confrontation with a nuclear-armed regional adversary would be to, first, inform enemy leaders of where the United States' important escalation thresholds lie, then issue threats or take other actions to deter them from violating those thresholds. But, assuming that would work, it would only address one side of the problem, as U.S. military operations could easily cross the opponent's escalation thresholds without U.S. leaders realizing it, prompting enemy leaders to respond under the belief that the United States is deliberately escalating the conflict, perhaps to levels that would threaten their survival. When confronting a nuclear-armed opponent, that would be a very dangerous impression to give. Therefore, should the United States find itself in confrontation with a regional nuclear power, it would behoove U.S. leaders to gather as much intelligence as possible regarding opponent perceptions of threat and vulnerability to discern where its critical escalation thresholds might lie, and then tread carefully when approaching them.

While seemingly straightforward, these prescriptions are easier said than done. Inadvertent escalation often occurs because neither side has fully considered where even its own escalation thresholds lie until one of them is crossed. In other cases, it occurs because one side considers a

[5] For the seminal work addressing the risks of inadvertent escalation during the Cold War, see Barry R. Posen, "Inadvertent Nuclear War? Escalation and NATO's Northern Flank," *International Security*, Vol. 7, No. 2, Autumn 1982, pp. 28–54; and Barry R. Posen, *Inadvertent Escalation: Conventional War and Nuclear Risks*, Ithaca, N.Y.: Cornell University Press, 1991.

threshold to be so obvious that it need not warn the other side of its existence. Complicating matters, thresholds often change over the course of a conflict, and belligerents may resist revealing where their critical thresholds lie, because to do so would acknowledge certain political or military vulnerabilities. A threshold illuminated provides a focal point for deterrence, but it also exposes a weakness that enemies might choose to exploit.

Given these challenges, should the United States find itself in confrontation with a nuclear-armed regional opponent, managing risks of inadvertent escalation would require a balanced strategy incorporating several features. The first step would be to make a considerable effort in advance to identify potential paths of escalation. This would require collecting and analyzing intelligence not only about each adversary's capabilities, vulnerabilities, and potential attitudes and behaviors, but also about important third parties—as well as assessing one's own thresholds. Next, analysts would need to sensitize military planners and decisionmakers to the risks of inadvertent escalation, both generally and in terms of specific escalation thresholds relevant to the contingency at hand, so they could consider those elements in their planning. Finally, operational plans would need to incorporate features designed to avoid critical escalation thresholds of other actors and steer enemy actions away from one's own thresholds, either by announcing their existence and issuing threats to deter their violation, or by visibly posturing forces in ways that cause the enemy to doubt that it could benefit from such violations.

Accidental Escalation

The escalation that results from accidental events might be the most difficult to manage in a confrontation or conflict with a nuclear-armed regional adversary. Like inadvertent escalation, accidental escalation is unanticipated, but instead of being an unexpected result of deliberate action, it is the consequence of events that were not intended in the first place. Such events might be the results of pure accident, such as bombing the wrong target due to a navigation error or outdated map, or striking a nuclear C2 node because faulty intelligence associates it with conventional forces. But accidental escalation can also result from military forces acting in ways not authorized or intended by national leaders, either because subordinate commanders or warfighters do not understand their leaders' intent or because they do, but overstep restraints for tactical expediency. As in other forms of escalation, this is a risk that stalks leaders on all sides of a conflict.

Since the leaders of nuclear-armed states confronting the United States would not intentionally engage in accidental escalation, U.S. leaders could do little to deter it from happening. The best U.S. leaders could hope to do is recognize that isolated incidents of enemy provocation might not be deliberate and modulate their responses to those events accordingly. That does not mean that they should ignore all provocations believed to be accidental. Failing to respond firmly to undue aggression, even when that aggression was not done deliberately, might signal a lack of resolve that emboldens even greater escalation. But military and political leaders would need to evaluate each incident in context and respond to it in a judicious manner.

As for managing U.S. forces to avoid accidental escalation during a confrontation with a nuclear-armed opponent, military leaders would need to identify factors that could lead to escalatory accidents and limit them to the extent possible. Approaches for managing these risks would depend on the nature of possible accidents. Those that could result from human error or carelessness could be minimized by training, exercise, and closer leadership attention. Risks of escalation resulting from subordinates misunderstanding commanders' intent or deliberately defying the limitations placed on them could be reduced by developing reasonable and coherent rules of engagement, communicating them effectively, and enforcing them rigorously. In sum, minimizing the risk of accidental escalation would require effective leadership at all levels in the chain of command in all phases of any military operation against a nuclear-armed regional adversary.

The Balance of Interests

No matter how sensitive U.S. leaders are to the need for effective threshold management, they could find it difficult to obtain their military objectives at affordable costs if their interests in the confrontation are substantially less than those of the opponent's. As Prussian military theorist Carl von Clausewitz so famously asserted, "The political object—the original motive for the war—will thus determine both the military objective to be obtained and the amount of effort it requires."[6] As the value of the political object also determines the level of motivation to pursue that object and the resolve to carry on in the face of resistance, the relative stakes in the conflict—that is, the balance of interests between the adversaries—also influences each side's perception of escalation thresholds and their tolerances for costs and risks.[7]

As we explained in Chapter Two, there would likely be a distinct asymmetry of interests in any confrontation between the United States and a nuclear-armed regional adversary. This suggests that the United States would be at an inherent disadvantage in such a conflict, because it would be conducting expeditionary operations against a nuclear-armed opponent in its own region and potentially on its own territory. In such settings, U.S. forces would be attempting to wage a limited war for limited stakes against an adversary who would have a much greater stake in the outcome and therefore be willing to take greater risks and pay greater costs in escalating the fight. This would be especially true were enemy leaders to conclude that U.S. forces were attempting to kill them or otherwise decapitate or remove their regime or disable their nuclear deterrent capabilities.

However, there is no reason to assume *a priori* that U.S. leaders would shy away from confrontations with emergent nuclear powers or that the United States could not manage

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[6] Carl von Clausewitz, *On War*, edited and translated by Michael Howard and Peter Paret, introductory essays by Peter Paret, Michael Howard, and Bernard Brodie, with a commentary by Bernard Brodie, Princeton, N.J.: Princeton University Press, 1976, p. 81.

[7] Alexander L. George, "Theory and Practice," in Alexander L. George and William E. Simons, eds., *The Limits of Coercive Diplomacy*, 2nd ed., Boulder, Colo.: Westview, 1994, p. 15.

escalation in conventional wars against them. Granted, in any war against a regional opponent, Western forces would be conducting expeditionary operations, but that in itself does not indicate that Washington would not perceive vital interests to be at stake. Moreover, the United States might not be the only side embarking on expeditionary operations. Depending on what interests are at stake, a future regional adversary might be sufficiently motivated and emboldened to conduct military operations outside its home territory, perhaps even outside its region. Whether a significant asymmetry of interests would emerge should the United States confront such a move and, if so, which side would perceive greater stakes in the issue (and manage to sustain those perceptions in the face of costly resistance) would depend on a wide range of factors. Among those considerations would be which side is trying to change the status quo and how the prospective change might serve or threaten the interests of other powerful actors in the region.

Finally and most crucially, whether U.S. leaders could manage escalation while waging a conventional war against a nuclear-armed adversary would greatly depend on whether they could posture and employ forces in ways that do not threaten the survival of the enemy regime, its leaders, or its nuclear deterrent forces. As explained in Chapter Two, that might be difficult, given the probable asymmetry in conventional military power between U.S. and opposing forces, the U.S. history of imposing regime change on its enemies, and how vulnerable opposing leaders might believe their regimes and nuclear forces to be. However, it should not be impossible in some scenarios, given the fact that the United States and the opponent would share some important interests.

The Importance of Recognizing Shared Interests

A key to managing escalation in conflicts with nuclear-armed opponents is to recognize that both sides would likely share some important interests. Principal among these shared interests is that neither would like to see the conflict escalate to a level at which nuclear weapons are employed. It goes without saying that U.S. leaders would not want the conflict to cross the nuclear threshold. However, some analysts have argued that a regional nuclear power might choose to demonstrate its nuclear capabilities in some way early in a confrontation to imbue its coercive threats with sufficient credibility to deter U.S. intervention or force U.S. forces already engaged to stand down. While we can never rule out such a possibility, it is more reasonable to expect that opponent leaders would not want to use nuclear weapons unless they felt their survival was seriously threatened.[8]

There are several reasons for this. First, an emergent nuclear power has a limited number of weapons in its arsenal. Using even one in a test or demonstration shot would reduce its stockpile and might reveal information about the remaining capabilities that make them vulnerable to a disarming preemptive strike. Second, assuming that leaders of such a state expect their regime to

[8] David S. Maxwell, "Is the Kim Family Regime Rational, and Why Don't the North Korean People Rebel?" *E-Notes*, Philadelphia, Pa.: Foreign Policy Institute, February 2012.

survive the confrontation at hand—and indeed that is their ultimate objective—crossing the nuclear threshold would generate substantial downstream political and economic costs from the international community. Depending on how provocative a step they might take across the blurry nuclear threshold, they could suffer penalties ranging from long-term economic and diplomatic sanctions to virtual ostracism as an international pariah. Finally and most importantly, while enemy leaders might indeed use one or more nuclear weapons were they to conclude that not doing so might cost them their lives or their regime, they could never be sure that using nuclear weapons would not simply guarantee the very destruction they would be trying to avoid, if not immediately, then sometime in the future.

The United States has a well-earned reputation as a powerful and wrathful actor in the international community, one with a long memory. It is the only nation that has ever used nuclear weapons to take human life, and no one has ever used nuclear weapons against the United States or one of its allies or friends. Therefore, although a nuclear-armed regional adversary might find a way to cross the blurry nuclear threshold that would create dilemmas for U.S. leaders, doing so would be enormously risky, because it could never confidently predict how the United States would react to such a development. So while we cannot rule out the possibility that enemy leaders might use a nuclear weapon at some point in a confrontation, it is unlikely they would take such risks before the conflict has reached the point at which they feel seriously threatened.[9]

With that consideration, as counterintuitive as it might seem, both sides also share an interest in not jeopardizing the survival of the nuclear-armed regional adversary's leaders, regime, or nuclear deterrent capabilities. It goes without saying that the opponent's most fundamental core interest is its own survival, but it is important to emphasize that U.S. leaders share that interest, given that threatening it risks pushing the opponent over the nuclear threshold. It follows then that, since opposing leaders equate their nuclear deterrent capabilities with insurance against regime change and threats to their survival, U.S. leaders also share an interest in not overtly threatening those capabilities and not attempting to neutralize them unless they are very confident that they could do so without fail. Rather, *the United States must hold the regime hostage, with its continued survival conditioned on its leaders not resorting to the use of nuclear weapons*.[10] Thus, the essence of escalation management when confronting or fighting a nuclear-armed regional adversary lies in *conditional assurance*, the promise to not destroy or remove the regime conditioned on the threat that the United States will pay whatever cost is needed to do so should the regime cross the critical U.S. escalation threshold.

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[9] An interesting analogy, though admittedly an imperfect one, is to consider nuclear weapons to be a form of life insurance. Regional powers are developing nuclear weapons largely because they feel threatened by the United States or some other powerful state and want to insure the survival of their regimes. Life insurance is a universal good—it is something everyone wants—but no one wants to cash in their own life insurance before it is absolutely necessary.

[10] As Thomas Schelling argued, dead enemy combatants offer no coercive leverage. But enemy cities (or in our case, the enemy regime), when kept alive and held hostage, can be powerful levers for compelling the enemy to exercise restraint. Schelling, 1966, pp. 6, 8, 191–192, 195.

In sum, with both sides sharing interests—though, granted, not in equal proportions—in not using nuclear weapons and not threatening the survival of the regime, its leaders, or its nuclear capabilities, the United States and a nuclear-armed regional adversary should have sufficient space for the tacit bargaining needed for effective escalation management . . . at least, in some scenarios. An important precondition to crafting and executing effective strategies for escalation management, therefore, is recognizing the kinds of scenarios in which such strategies are possible versus what kinds of campaigns are so dangerous that they should be avoided. We shall explore this question in our analysis of three geostrategic challenges.

Managing Escalation in Three Geostrategic Challenges

Thus far, we have explained the motives and mechanisms of escalation in the importance of understanding each side's interests in any given confrontation. We now discuss how to anticipate and manage the escalation pressures that could emerge at various levels of confrontation in three geostrategic challenges: a maritime confrontation, a conventional invasion of a regional neighbor, and a U.S. compellence campaign. The scenarios presented are notional, and actual conflicts could turn out differently from how they are depicted here; however, this examination illuminates the escalation dynamics that could emerge in various confrontations in each of these general geostrategic challenges and offers insights for how U.S. leaders can manage them.

A Maritime Confrontation

The Crisis

Our analysis of the maritime confrontation examined a crisis that could arise from either of two variant scenarios: one in which U.S. forces stop and attempt to board an emergent nuclear state's vessel on the high seas and another in which such an actor seizes a U.S. vessel. Given the fact that U.S. naval and air force projection capabilities in the global commons are far superior to those that any regional adversary could muster in the near future, these scenarios may be the least likely to occur. However, they are not beyond the realm of possibility. States that have poor relations with the United States have been known to engage in provocative behaviors, such as the transshipment of weapons and illicit substances and materials. Some that have emerged as regional nuclear powers, such as Pakistan and North Korea, have done so with the assistance of established nuclear states, which, in addition to sharing expertise, have secretly shipped them nuclear weapon technologies, ballistic missiles, and other delivery system components.[11] Emergent nuclear states might be motivated to further proliferate their newly acquired

[11] Canadian Secret Intelligence Services, "Nuclear Weapons Proliferation," *Perspectives*, Report No. 2001/10, February 25, 2002, modified June 7, 2013; Sankar Shrivastava, "US Report: China Gifted Nuclear Bomb and Pakistan Acquired the Technology," *The World Reporter,* November 18, 2009. Also see Chaim Braun and Christopher F. Chyba, "Proliferation Rings: New Challenges to the Nuclear Nonproliferation Regime," *International Security*, Vol. 29, No. 2, Fall 2004, pp. 5–49.

capabilities to other states for political reasons or financial gain, and they might also engage in smuggling narcotics or other contraband cargoes to prop up failing economies or bankroll other illicit activities.[12] Although stopping ships on the high seas violates the sovereign rights of the states that flag them, U.S. leaders might decide to do so if they have reliable intelligence that one is carrying materials that could pose a serious danger to U.S. security or citizens and no opportunity for port inspection is expected before it delivers its illicit cargo.

Therefore, the first maritime crisis conceived for exploration in this analysis involved the U.S. Coast Guard intercepting a cargo vessel flagged by a nuclear-armed state that was suspected of carrying narcotics. The ship was heading for a port in a Latin American state friendly to the nuclear power, which had refused U.S. requests to inspect the cargo and seize it if necessary to keep it from being offloaded and trucked over land into the United States. When the Coast Guard stopped the vessel, its captain threatened armed resistance to a boarding. The Coast Guard captain chose to not attempt a forced boarding, but refused to let the vessel proceed. A standoff ensued, and the nuclear-armed regional state and the United States both began moving air and naval assets to the scene, each attempting to gain an advantage in the correlation of forces.

While this scenario is plausible, it is by no means the only way the United States could find itself in a maritime confrontation with a regional power. In fact, nuclear-armed regional adversaries might deliberately initiate maritime crises with the United States in the future. Regional states hostile to the United States have triggered such crises in the past—North Korea's 1968 seizure of the USS *Pueblo* and the Khmer Rouge's 1975 seizure of the SS *Mayaguez* offer dramatic examples—and such incidents might occur more frequently in the future, as more antagonistic regional actors acquire nuclear weapons and become emboldened to challenge U.S. maritime activities in their exclusive economic zones and beyond.[13] Therefore, we also explored what pressures for escalation might develop in a military confrontation resulting from the seizure of a U.S. vessel by an emergent nuclear-armed state.

What escalation dynamics might arise in such confrontations would depend a great deal on where they occur. Given the United States' asymmetric advantage in conventional warfighting and force projection capabilities in most areas of the world, a regional adversary would be unable to present a credible military challenge to U.S. forces unless the confrontation were to occur close to its bases and relatively far from U.S. military assets in the region. Were it to occur where U.S. air and naval capabilities could reach the scene in a short time—as would likely be the case should U.S. authorities initiate the crisis by stopping a vessel at sea—the United States would be

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[12] Director of Central Intelligence, *Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, 1 January Through 30 June 2003*, Washington, D.C., undated. Also see Arnaud de Borchgrave, "A Nuclear Option for Saudi Arabia?" *New Atlanticist* blog (Atlantic Council), December 7, 2011; "North Korea Ship with 'Military Cargo' Held by Panama," 2013.

[13] As Barry Posen has argued, the United States has undisputed command of the global commons, but not of "contested zones"—the airspace above and the littoral seas around regional opponents (Barry R. Posen, "Command of the Commons: The Military Foundation of U.S. Hegemony," *International Security*, Vol. 28, No. 1, Summer 2003, pp. 5–46).

able to bring enough force to bear at the point of confrontation to deter the opponent from deliberately escalating the crisis locally, and U.S. forces should easily prevail in a skirmish should some inadvertent behavior or accidental event push the confrontation to violence.

An opponent finding itself in such a crisis would have few near-term avenues for escalation. It would almost certainly intensify its anti-American rhetoric in the global media, but it would not be able to make a nuclear threat credible, given that the U.S. move to impose its military dominance in the global commons would not threaten any of its critical escalation thresholds. Should adversary leaders resort to nuclear brandishing anyway—they might do so to alarm the international community as part of an effort to discredit the United States and bring political pressure to bear on U.S. leaders—they would be bluffing. U.S. leaders could issue counter-threats or simply ignore the opponent's remonstrances, whichever they determine would best serve U.S. interests in the context of the broader geopolitical situation.

The Conventional Conflict

While the opponent would likely have few options were a maritime confrontation to occur far from its shores, the dynamics would be different were it to occur closer to its homeland, with little or no U.S. military capabilities immediately available for a timely response. These were the conditions in which the USS *Pueblo* and SS *Mayaguez* incidents occurred, and they are probably those in which future regional adversaries might choose to initiate maritime crises. Should they do so, U.S. leaders might decide to launch rescue efforts, and military operations in support of those could lead to conventional conflicts.

How such a conflict would unfold against a nuclear-armed opponent and what escalation dynamics might emerge would depend in large part on where the captors are attempting to take the U.S. vessel and its crew and how soon the United States could bring its military capabilities to bear. Were the United States able to get sufficient forces to the scene to stop the vessel and its captors before the opponent could get them within range of its land-based IADS, events would likely play out in ways similar to those described above, except the presence of hostages might cause a temporary standoff, forcing U.S. leaders to choose between attempting a maritime hostage rescue operation or negotiating for the release of the vessel and its crew. But the closer the opponent is able to get the captured vessel to a port in its national territory, the more difficult it would be to militarily defeat the aggression without escalating the fight.

Should the opponent manage to get the captured vessel beneath its IADS coverage, U.S. leaders would need to degrade the IADS locally without dismembering it in a way that would expose the regime or its nuclear capabilities to attack. That would suggest tactics emphasizing electronic warfare on local warning and C2 targets and engaging enemy fighters in the air, versus conducting offensive counterair (OCA) strikes on enemy airbases, thereby avoiding kinetic attacks on mainland targets. If U.S. forces could not get to the scene before the vessel is taken into an enemy port, it would be very difficult, and perhaps impossible, to recapture it without escalating the fight. If the destination port were on an island, U.S. forces might be able to fight

their way in to recapture the vessel without driving the opponent to the use of nuclear weapons by abstaining from strikes on the mainland and using the sea to buffer the conventional fight from the adversary's critical escalation thresholds. But such an operation would require firm conditional assurances that the United States is only interested in retrieving the vessel and its crew.

Yet, even if winning the fight and recapturing the vessel were militarily feasible, U.S. leaders would still face a serious challenge in locating and rescuing the hostages—a savvy opponent would disperse them or move them to the mainland as soon as possible—making it unlikely they would attempt it. If the vessel and crew were taken to a mainland port, it would probably be impossible to rescue them via force of arms without escalating to dangerous levels, especially if the port were located close to key leadership, IADS, or nuclear C2 nodes. U.S. leaders almost certainly would not attempt a rescue operation in those circumstances.

The Nuclear Threshold

While it is not inconceivable that a maritime confrontation could be the first in a chain of events escalating a fight between the United States and a regional adversary so dramatically that the opponent crosses the nuclear threshold, it would be highly improbable if prudently managed. Therefore, rather than discuss the ways U.S. leaders could respond to such an event in this section, we will do so in a later scenario.

A Cross-Border Invasion

The Crisis

As mentioned in Chapter Two, shortly after developing their nuclear weapons, some previous states with emergent nuclear capabilities have behaved in ways that triggered interstate crises. Dissatisfied with the regional status quo, they set out to change it by force, believing their newly acquired capabilities would deter rivals from resisting them, and provoking crises or conflicts when their opponents did not acquiesce as expected.[14] Given this historical pattern, it is reasonable to suppose that states with emergent nuclear capabilities may make similar mistakes

[14] Examples include Mao Zedong and Josef Stalin encouraging Kim Il Sung to invade the Republic of Korea in 1950, believing the Soviet Union's newly acquired nuclear capabilities would deter U.S. intervention; China provoking a border conflict with the Soviet Union in 1969 after entering the nuclear club in 1964; and Pakistan provoking the 1999 Kargil conflict and the 2001–2002 nuclear crisis with India after both states tested their first nuclear devices in 1998. For more on these cases, see Sergei N. Goncharov, John W. Lewis, and Xue Litai, *Uncertain Partners: Stalin, Mao and the Korean War*, Stanford, Calif.: Stanford University Press, 1993, pp. 164–166; Li Xiaobing, Allan R. Millett, and Bin Yu, eds. and trans., *Mao's Generals Remember*, Lawrence, Kan.: University Press of Kansas, 2001, p. 63; V. R. Ragavan, "Limited War and Nuclear Escalation in South Asia," *Nonproliferation Review,* Vol. 8, No. 3, Fall/Winter 2001; Rodney W. Jones, "Nuclear Stability and Escalation Control in South Asia: Structural Factors," in Michael Krepon, Rodney W. Jones, and Ziad Haider, eds., *Escalation Control and the Nuclear Option in South Asia,* Washington, D.C.: Henry L. Stimson Center, November 2004, pp. 25–26. Also see Morgan et al., 2008, pp. 97–106.

in the future, starting conflicts with neighbors friendly with Washington, thereby sparking confrontations with the United States.

The cross-border invasion scenario we examined in this research began with an escalating series of border clashes between a state with emergent nuclear capabilities and a neighbor friendly with the United States. The clashes resulted from the neighboring state attempting to interdict illicit narcotics that a drug cartel was transporting through its territory. The cartel was using the nuclear-armed state's territory as sanctuary under a financial arrangement with that state's corrupt regime. When the neighboring state conducted a light infantry raid across the border to destroy the drug cartel's bases there, the regime used the incursion as a pretext to launch a mechanized invasion into its territory. The nuclear-armed state's conventional forces were more numerous and heavily armored than those of its neighbor, and the combined-arms assault made rapid progress toward the neighbor's capital city. The government of the besieged state appealed to the United States to intervene in its defense, its pleas for help becoming increasingly shrill as lead elements of the enemy spearhead drew close to the capital and began consolidating for the final assault.[15]

This scenario would present sizable challenges for U.S. leaders. Although U.S. advisors and some SOF were scripted as present in the defending state to assist its counternarcotics and counterterrorism programs, no significant U.S. conventional capabilities were available in the region. Even if there had been, in a scenario such as this one, there would be no time to assemble and deploy a major U.S. ground force before the capital fell. That said, the lack of available ground forces is a bit of a red herring in this scenario, because the principles of threshold management would indicate that U.S. leaders should not try to deploy a major ground force in territory contiguous to a nuclear-armed regional adversary, even if they had time to do so. Throwing heavy U.S. ground forces into the fight might suggest to enemy leaders that the United States is posturing for regime change, and the assembly points and logistics tail of such forces would offer inviting targets for nuclear strikes, were enemy leaders to feel sufficiently threatened when the tide of battle turned against them.[16]

A course of action more consistent with a threshold-management approach would be for U.S. leader to demand that the nuclear-armed state cease all offensive operations immediately. They should inform its leaders that an assault on its neighbor's capital would cross a threshold unacceptable to the United States and would risk the destruction of their army. At the same time, U.S. leaders should, as quickly as possible, begin posturing airpower in regional bases close enough to win air superiority, conduct strike operations, and provide close air support (CAS) to friendly forces in areas around the capital, should a U.S. military intervention become necessary.

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[15] It is important to point out that, while these events constitute a conventional conflict between the regional belligerents, the scenario is still in the crisis phase from the viewpoint of the United States. U.S. forces are not yet engaged, and U.S. leaders must decide how to respond to a nuclear-armed state's aggression against a regional friend.

[16] Wilson and Colby, 2008, p. 5.

However, U.S. basing should, to the greatest extent possible, be done outside the threat rings of the adversary's nuclear strike capabilities.

Should opposing leaders reply to U.S. demands and force posturing with a nuclear threat, U.S. leaders should respond with assurances conditioned with counter-threats, raise the defense readiness condition (DEFCON) level of U.S. nuclear forces, and visibly begin patrolling in the region with nuclear-capable bombers. On the other hand, should the adversary abstain from brandishing nuclear weapons, the United States should do so as well. U.S. leaders should make every effort to keep the scope of the crisis well below the nuclear threshold and the terms of debate focused on the conventional invasion. The objective should be to compel the nuclear-armed regional adversary to terminate its conventional military operations and withdraw all of its forces from its neighbor's territory, thus returning to the *status quo ante bellum*.

The Conventional Conflict

While the ideal resolution to the crisis, at least from the U.S. perspective, would be one in which the adversary were to immediately cease hostilities and withdraw its forces, such an outcome would be unlikely at this point in our notional scenario. Historical cases indicate that posturing long-range strike aircraft in ways that impose a potent threat without exposing them to preemption can have a powerful stabilizing effect on crises *before shots are fired*;[17] however, once belligerents are enjoined in combat, it is difficult to compel an aggressor to withdraw short of achieving its objectives without first demonstrating that one can deny it success in its conventional military operations.[18] With the nuclear-armed state's mechanized forces consolidating for a final assault on its enemy's capital, its leaders would likely be confident of their imminent success, despite Washington's demands for withdrawal and the growing threat of U.S. airpower in the region. Therefore, were U.S. leaders to conclude that defending this state is an important enough interest to accept the costs and risks of war with a nuclear-armed adversary, the United States would have to enter the conventional conflict.

The nature of the geostrategic challenge in this scenario suggests that it would be a likely candidate for employing airpower in an operational concept that some scholars have come to describe as the "Afghan model."[19] In this approach, U.S. airpower would be brought to bear in

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[17] Forrest E. Morgan, *Crisis Stability and Long-Range Strike: A Comparative Analysis of Fighters, Bombers, and Missiles*, Santa Monica, Calif.: RAND Corporation, MG-1258-AF, 2013, pp. 57–70.

[18] Robert A. Pape, *Bombing to Win: Air Power and Coercion in War*, Ithaca, N.Y.: Cornell University Press, 1996, pp. 314–316; Daniel L. Byman, Matthew C. Waxman, and Eric Larson, *Air Power as a Coercive Instrument*, Santa Monica, Calif.: RAND Corporation, MR-1061-AF, 1999, pp. 37–39.

[19] As the name implies, the concept was first used in Afghanistan in 2001, when U.S. leaders sought to impose regime change there after Taliban authorities refused to turn over Osama bin Laden in wake of the 9/11 attacks. U.S. leaders and citizens wanted prompt action against the defiant regime, but due to that country's remoteness and relative inaccessibility, it would have taken many months to deploy a conventional invasion force such as the one used in Iraq in 1991. Therefore, the United States resorted to supporting the indigenous forces then fighting a civil war against the Afghan Army with airpower, with targeting guidance provided by the SOF present advising the rebels. To the surprise of many in Washington, what was first envisioned as a holding action to gain time to get

direct support of the beleaguered allied army, multiplying its effectiveness in the fight against the forces arrayed against it. U.S. fighters would drive off or destroy any enemy aircraft over the friendly capital and areas where allied and enemy forces are located. Then, strike operations would commence against enemy mechanized forces, with targeting guidance provided by the U.S. SOF troops already in country. As friendly forces regain their footing, U.S. airpower would provide them CAS, interdict enemy lines of communication (LOCs) inside the borders of the allied state, and continue decimating enemy mechanized forces.

Assuming this concept would be effective in this scenario and others like it, it would have distinct advantages over other approaches in terms of escalation management; however, U.S. leaders would still need to take several additional precautions. First, as in the maritime scenario, they would have to gain air superiority using defensive counterair sorties over the battlefield, versus conducting OCA strikes on bases in the enemy's homeland. Second, all interdiction strikes and attacks on other rear-area activities supporting enemy forces would need to be done to the greatest extent possible against targets inside the neighboring state.

Meeting these two constraints might be challenging if the neighboring state's capital is close to the border with the nuclear-armed adversary. The enemy might be able to marshal its forces and position key support activities within the sanctuary of its own borders, and coverage of its homeland IADS might extend over the battlespace in the neighboring country, threatening U.S. aircraft operating there. In such a situation, U.S. airpower may be able to operate with acceptable levels of risk by degrading the IADS locally with nonkinetic attacks and engaging enemy ground forces only after they cross the border. If not, they should be judicious in conducting kinetic strikes on IADS elements and enemy forces inside the nuclear-armed state, in efforts to avoid creating systemic effects that would panic enemy leaders. U.S. leaders would need to underscore their conditional assurances that U.S. forces are not seeking regime change or threatening enemy leaders or their nuclear deterrent capabilities.

Finally, as enemy forces begin suffering the effects of U.S. airpower and allied forces begin driving them back, U.S. leaders need to be open to overtures from enemy leaders seeking a way to end the conflict. Should they express a genuine desire to negotiate, U.S. and allied leaders should allow them a face-saving way out, but they should not agree to a halt-in-place during negotiation or any final settlement that cedes allied territory to enemy control. In fact, depending on how vulnerable to further destruction the enemy invasion force has become, U.S. and allied leaders might have sufficient leverage to compel the enemy to resolve some of its neighbor's original grievances—it might, for instance, be compelled to agree to eliminating the drug cartel sanctuaries on its territory—but U.S. leaders should resist the temptation (and any allied pressure) to punish the enemy or add new demands that would significantly exceed the *status*

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more substantial forces in place turned out to be so effective that it defeated Afghanistan's 50,000-man army in less than two months. See Richard Andres, Craig Wills, and Thomas E. Griffith, Jr., "Winning with Allies: The Strategic Value of the Afghan Model," *International Security*, Vol. 30, No. 3, Winter 2005/2006; Richard Andres, "The Afghan Model in Northern Iraq," *Journal of Strategic Studies*, Vol. 29, No. 3, June 2006.

quo ante bellum. Ultimately, enemy leaders should be allowed to withdraw their forces and get some concession in the settlement, even if only symbolic, that would allow them to save face and claim some measure of victory in front of domestic constituents.

The Nuclear Threshold

There is a significant risk that a conflict such as this one could push an adversary across the nuclear threshold if not carefully managed, and such a disaster could also occur due to events beyond U.S. control. With nationalist sentiments enflamed after the invasion of their country, allied leaders might be difficult to restrain once their military forces gain the upper hand. They might not allow enemy forces to withdraw unmolested after a settlement. More seriously, were the enemy to continue hostilities until the allied counteroffensive drives its forces all the way back across its border, allied forces might not stop there. They might plunge into the enemy's territory, which would cross at least one dangerous escalation threshold and potentially others, depending on how deep were they to penetrate and how much such an incursion would threaten the regime's stability and its nuclear forces, leaders, and cities. Therefore, it would be critically important for U.S. leaders to counsel their alliance or coalition partners to exercise the restraint needed to avoid such situations—even using coercive diplomacy or deterrent threats, if necessary, to gain compliance. Yet even were the ally to exercise a reasonable degree of restraint, destroying the enemy army in allied territory or simply defeating it and forcing it to withdraw in humiliation could destabilize the enemy government. Facing prospects of any of these developments, enemy leaders could resort to employing one or more nuclear weapons in desperate efforts to appear in control to domestic constituents and shock U.S. and allied leaders into ceasing hostilities on their terms.

How U.S. leaders should respond to such a development would depend on how egregious an act the enemy might commit. A provocative but measured nudge at the threshold, such as the use of a nuclear test to signal a threat, might be answered with conditional assurances and nuclear counter-threats, accompanied by adjustments in operational tempo and, to the extent necessary, persuasive or coercive diplomacy with allied leaders to ensure their restraint.[20] A more definitive step across the threshold, on the other hand, would demand a punitive response. If that step did not harm people directly, the response would need to be restrained and proportionate to the offense, given the fact that the adversary would likely have additional weapons in its arsenal. For instance, the detonation of a nuclear weapon somewhere outside the adversary's border that did not harm people or infrastructure—say, a demonstration shot into an unoccupied stretch of desert or ocean—might be met with explicit threats that any further use of nuclear weapons would result in catastrophic destruction, while adjusting conventional operations to strengthen

[20] It almost goes without saying that U.S. leaders would also maximize the use of strategic communications to shape international opinion against enemy leaders for brandishing nuclear weapons during a conventional conflict brought on by their invasion of a neighboring state. The United States would bring as much pressure to bear as possible to deter any further nuclear use.

assurance and, if needed, relieve destabilizing pressures on the regime to the extent possible. Alternatively, U.S. leaders might consider answering an adversary's use of a nuclear weapon in space to destroy orbital infrastructure or in the atmosphere to generate EMP effects with a U.S. strike in kind, detonating a nuclear weapon over the adversary's military forces or one of its cities to damage them with EMP. U.S. leaders would need to make it brutally clear, however, that the United States would not answer tit-for-tat a second time; any further use of nuclear weapons would result in the adversary's annihilation.

In addition to the above, were a regional adversary to explode any nuclear device outside its borders during a crisis or conflict, even if that detonation harmed no people or infrastructure, U.S. leaders should begin a concerted campaign to declare the regime an international pariah. In such a course of action, every effort would be made to completely isolate the state from all trade and interaction with the rest of the world until the regime steps down or is removed from power.[21] Given the adversary's menacing use of a nuclear weapon, such a campaign would likely receive near-unanimous support in the international community. Were any state to refuse to support the embargo, it would be roundly condemned, perhaps even sanctioned.

Should the adversary damage additional property in subsequent detonations, or use one or more nuclear weapons to harm people, the United States might have no alternative but to take dramatic action to remove the regime by force. This would require eliminating the adversary's nuclear capabilities. As explained in Chapter Three, it would be impossible to do that with sufficient speed, simultaneity, and destructive force using conventional weapons alone once the adversary's nuclear weapons are mated to ballistic missiles. Rather, were U.S. leaders to conclude that disarming and removing the regime is necessary, U.S. forces would probably need to do it with some combination of nuclear and conventional strikes. They would need to launch enough weapons to simultaneously destroy as much of the regime's nuclear capabilities as possible before it could do further damage.

A Compellence Campaign

The Crisis

On several occasions since the end of the Cold War, the United States has employed military force to compel state or substate adversaries to change their behavior. U.S. forces have conducted operations to compel opponents to relinquish territory captured from neighbors, cease artillery attacks on noncombatants in towns and UN safe havens, stop abusing ethnic minorities living in their countries, and cease and reverse ethnic cleansing campaigns. Airpower has usually

[21] While this might seem to contradict assuring the opponent that the United States is not seeking regime change, we are separating short-term assurances from long-term aspirations. Washington would continue assuring the opponent that the objectives of ongoing U.S. military operations do not include regime change. At the same time, U.S. diplomatic efforts to isolate the enemy regime would have a primary objective of punishing it as a deterrent example to other states. It would have a secondary and unstated long-term goal of generating sufficient pressure on the regime that its leaders are eventually forced to step down or removed by their "selectorate."

been the primary military instrument employed in these operations, and sometimes the only one. Given the political instability and poor governance that continues to plague many regions around the world, one can reasonably expect U.S. forces to be called on to conduct more compellence campaigns in the future. Should the state triggering some future crisis be an emergent nuclear power, U.S. leaders will want to know whether and how they can threaten or apply military force to compel it to change its behavior without escalating the confrontation to dangerous levels.

The notional scenario we explored in this analysis involved a U.S. effort to compel a nuclear-armed state devolving into civil war to stop conducting military attacks on dissident groups. The instability in that country had developed and become increasingly severe over the course of several years, due to economic hardships caused by a U.S.-led international trade embargo punishing the regime for earlier misbehavior.[22] As economic conditions grew steadily worse, citizens began demanding that the ruling junta to step down, and opposition parties with a range of ideologies emerged to challenge the government. Police attempts to violently repress these groups triggered national demonstrations, which progressed to riots, with an escalating cycle of violence. When the army opened fire on rioters in a major city, several of the strongest groups armed themselves and began openly resisting government authority. The junta then declared martial law and began conducting military operations against resistance strongholds. These developments were regularly reported in various news media and Internet forums, which often showed graphic evidence of government brutality against civilians. Sympathetic citizens in the United States and other countries were outraged, and political pressure mounted on the United States to intervene in the crisis to put an end to the violence. U.S. leaders sought options for compelling the junta to implement an immediate ceasefire and enter negotiations with opposition groups.

This kind of scenario would confront U.S. leaders with daunting challenges. U.S. leaders could posture airpower in the region and issue demands that the adversary cease its attacks, but it is difficult to compel a state to stop a military operation short of achieving its objectives without demonstrating that one can deny it success in that operation. Threats to do so before actually employing force would tend to ring hollow against an opponent with nuclear weapons.

The Conventional Conflict

Attempting to execute a compellence campaign against a nuclear-armed regional adversary would be fraught with escalation risk. To do so via a denial strategy, U.S. air forces would have to gain air superiority over the opponent's cities, fly search-and-destroy missions against dispersed military forces there, and provide CAS support to opposition groups as needed. Alternatively, U.S. leaders might try to employ airpower in a punishment campaign, bombing

[22] The script of this map exercise picked up from where the last one left off. That scenario ended with the adversary striking a regional city with a nuclear weapon. In the script developed for this exercise, the U.S. responded by declaring the regime an international pariah and imposing an embargo on all commerce save for human essentials. The embargo was widely (though not universally) supported, severely crippling the adversary's economy.

targets that the regime or its key supporters value in hopes of driving their expectation of future costs so high that they ultimately comply with compellent demands. Unfortunately, punishment has rarely proven to be a reliable means of compellence when done in absence of an effective denial strategy, the rare examples of success occurring only when the opponent had preexisting ulterior motives for settlement or when the stakes were relatively low.[23] Neither would be the case in our notional scenario, where regime leaders are fighting for their survival against domestic rivals.

In either strategy, however, U.S. forces would have to suppress the opponent's IADS to apply airpower with any persistence. As mentioned several times already, attempting to do that would likely cross a critical escalation threshold, because adversary leaders might interpret it as preparation for a decapitation campaign or a disarming attack against their nuclear deterrent forces. Such U.S. actions would be particularly risky in a failing-state scenario. Opponent leaders would be searching for ways to regain the loyalty of their citizens, and scapegoating an external enemy might be an attractive option. The United States could be fashioned as an external aggressor, one with conventional capabilities so threatening that the regime might have to lash out against it with a nuclear weapon in "defense of the homeland."

Moreover, it would be difficult to anticipate how a campaign of sustained bombing would affect the dynamics of the ongoing struggle within the adversary's state. It might galvanize public support behind the regime, enabling it to use force even more ruthlessly to crush all remaining opposition. On the other hand, it might so weaken the regime that it would fall to the onslaught of the groups against it or to a general public uprising. Either outcome would be dangerous, but the latter development would create particularly acute anxieties for U.S. leaders and others in the international community due to the uncertainty it would generate. Would the state devolve into an ungoverned territory, or would a powerful group emerge from the chaos and impose order? Were the latter to occur, what would be the new group's ideology and its attitudes and policies regarding the United States and other governments? In any event, who would have control of the nuclear weapons?

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[23] There is a rich literature on compellence and related fields, such as coercion and coercive diplomacy. For some of the better works, see Schelling, 1966; Robert J. Art, "Coercive Diplomacy: What Do We Know?" in Robert J. Art, and Patrick M. Cronin, eds., *The United States and Coercive Diplomacy*, Washington, D.C.: United States Institute of Peace Press, 2003, pp. 359–410; Alexander L. George, *Forceful Persuasion: Coercive Diplomacy as an Alternative to War*, Washington, D.C.: United States Institute of Peace Press, 1991; Alexander L. George and William E. Simons, *The Limits of Coercive Diplomacy*, 2nd ed., Boulder, Colo.: Westview Press, 1994; Lawrence Freedman, ed., *Strategic Coercion: Concepts and Cases*, Oxford, UK: Oxford University Press, 1998; Peter Jakobsen, *Western Uses of Coercive Diplomacy After the Cold War: A Challenge for Theory and Practice*, New York: St. Martin's Press, 1998; and Daniel L. Byman and Matthew C. Waxman, *The Dynamics of Coercion: American Foreign Policy and the Limits of Military Might*, Cambridge, UK: Cambridge University Press, 2002. For analyses of the efficacy of airpower and other forms of military force in coercion, see Byman, Waxman, and Larson, 1999; David E. Johnson, Karl P. Mueller, and William H. Taft, *Conventional Coercion Across the Spectrum of Operations: The Utility of U.S. Military Forces in the Emerging Security Environment*, Santa Monica, Calif.: RAND Corporation, MR-1494-A, 2002; Pape, 1996.

Given the low probability that a compellence campaign against a nuclear-armed adversary would be successful and the daunting uncertainties and dangers that would result from attempting it, U.S. leaders would be well advised in not intervening in this kind of crisis. Nevertheless, should they decide that the United States has no alternative but to do so, several considerations should guide their actions.

First, before intervening in the conflict, U.S. leaders should gather all the information they can about each group's political positions and affinities, strength relative to other groups, and military posture. It would be particularly important to gather as much information as possible about the attitudes and loyalties of the regime's military forces. Are there sectarian divisions? What are their political orientations? Which elements are most loyal to the regime? Do any of the military factions have political, ethnic, or religious affinities with any of the opposition groups? Most importantly, which elements have control of nuclear weapons, and where do their loyalties and sympathies lie? Answers to these questions will reveal whether there are, or might develop, seams in the regime that could be exploited with "wedge strategies," i.e., secret offers to accommodate selected individuals or groups to influence the dynamics of events there and gain information on, and ideally, control of, the nuclear weapons in the event of regime failure.[24] When as much of this information as possible is gathered and assessed, U.S. leaders can develop a strategy for how they will intervene in the conflict. What demands, threats, and assurances they should deliver to regime leaders and other actors would depend on which of them has the best chances of prevailing in the internal struggle, which has the greatest chance of securing control of the nuclear weapons, and ideally, which espouses values most agreeable with those of the United States.

Second, as in the cross-border invasion scenario, any compellent demands and conditional assurances should be accompanied by a visible flow of airpower into the region. To the greatest extent possible, all aircraft should be postured beyond the range of the opponent's nuclear strike assets. The objective should be to generate pressure against the regime in ways that minimize its options for lashing back against the United States and its regional partners and friends.

Third, when U.S. leaders finally resolve to employ lethal force, they should do so using standoff capabilities as much as possible. Any inhabited-platform penetrations of enemy airspace deemed necessary should be done with stealthy aircraft supported by limited and localized suppression of the enemy IADS, in efforts to avoid panicking regime leaders in ways that might push them toward the nuclear threshold. Assuming that the regime retains the loyalty of its military forces and firm control of its nuclear capabilities, the goal of the campaign should be to use pressure on the regime's stability as a lever to compel compliance with U.S. demands,

[24] The concept of "wedge strategy"—developing policies to prevent or divide adversary coalitions—has recently attracted some scholarly attention. For more on wedge strategies, see Timothy W. Crawford, "Preventing Enemy Coalitions: How Wedge Strategies Shape Power Politics," *International Security*, Vol. 35, No. 4, Spring 2011, pp. 155–189; Yasuhiro Izumikawa, "To Coerce or Reward? Theorizing Wedge Strategies in Alliance Politics," *Security Studies*, Vol. 22, No. 3, August 1, 2013, pp. 498–531.

modulating the employment of airpower to increase or decrease that pressure as needed.[25] At the same time, however, U.S. leaders must keep in mind that the regime's survival is an interest they share with enemy leaders—the United States must keep the hostage alive to have any coercive leverage over it, and not simply to compel the enemy's compliance with demands, but to deter its use of nuclear weapons as well.

Finally, U.S. leaders should be ever vigilant for indications that their counterparts are seeking a way to escape the crumbling regime and are willing to provide information about the nuclear weapons (and, ideally, custody of them) in exchange for safe passage or sanctuary. Not only would such intelligence be critical for securing the nuclear weapons in a failed-state scenario, but providing enemy leaders a viable "off-ramp" could defuse their desperation, relieving the pressure for them to gamble on doing something dramatic.[26]

But even if U.S. leaders are sensitive to the need to provide such off-ramps, a compellence campaign would be a dangerous and delicate balancing act, one with grave consequences should it go awry. U.S. leaders should carefully weigh the risks and magnitude of those consequences against the expected value of any benefits they hope to achieve before embarking on such a path.

The Nuclear Threshold

An adversary's use of one or more nuclear weapons in response to a U.S. compellence campaign would create enormous challenges for U.S. leaders. Were the enemy regime still stable and in firm control of its military forces when it crossed the nuclear threshold, the appropriate U.S. response would depend on how egregious an act the enemy had committed, and the relevant parameters of the challenge would be similar to those described in "The Nuclear Threshold" section of the cross-border invasion scenario described previously.

If, on the other hand, the enemy's use of nuclear weapons were to constitute the last desperate act of a disintegrating regime, a strike by a rogue element of that regime, or an attack by some other actor who had obtained control of one or more weapons, how the United States would need to respond and what options would be available to it would vary greatly depending on prevailing circumstances on the ground. U.S. objectives would be to secure or destroy the remaining weapons and punish those responsible for the attack in a way that would restore credibility to future deterrent threats, while minimizing collateral damage and harm to noncombatants. Whether and how those objectives could be achieved would largely depend on how much intelligence was available to answer a host of questions, such as: How many nuclear

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[25] Were the regime to lose the loyalty of its military forces or control of its nuclear weapons, another strategy would be needed. The primary objective of that strategy would be to secure control of the nuclear weapons in friendly hands, or, at least, in the hands of an actor that could be deterred from using them or transferring them to other less accountable actors. The nature and viability of the strategy would depend on the political, military, and societal situation in the enemy country and how much U.S. leaders could learn about those details.

[26] Lieber and Press refer to this tactic as offering enemy leaders a "golden parachute," an expression they apparently borrowed from the U.S. corporate world describing cases in which the leaders of failing companies are offered generous severance packages to encourage them to leave without a fight. See Lieber and Press, 2013, p. 7.

weapons remain? In whose hands do they reside? What delivery capabilities are available to their custodians? What early warning capabilities do those parties possess? And, of course, what are the precise locations of the remaining weapons? Answers to those questions and many others would be needed to help U.S. leaders decide to what extent any action were possible and, if so, whether they should attempt inserting U.S. forces to secure the remaining weapons and apprehend perpetrators of the attack, or whether they should strike from afar to destroy the weapons and those individuals. Were U.S. leaders to elect to do the latter, they would have to decide whether such strikes could be carried out with conventional weapons or would require nuclear weapons to achieve the probability of success deemed necessary to make the effort viable.

Looking at the Larger Picture

While this chapter draws to a close on an ominous note, readers should be encouraged by the broader conclusions. Findings of the parametric analysis suggest that U.S. leaders have more options for confronting emergent nuclear-armed regional adversaries than they might have assumed. If we define the failure of escalation management as the point at which an adversary resorts to the use of nuclear weapons, then viable approaches for protecting U.S. interests are feasible in at least two of the three scenarios we examined.

A maritime confrontation is the scenario in which the United States could apply force the most liberally with the lowest risk of uncontrolled escalation. Due to the asymmetric advantages that U.S. forces enjoy in force projection capabilities in the global commons, a regional adversary would likely be deterred from putting up serious resistance to a U.S. intervention there, and U.S. forces would almost certainly dominate the conflict were conventional deterrence to fail. The adversary would not likely resort to nuclear brandishing in such an encounter, as U.S. operations would not present a credible threat to the regime, its leaders, or their nuclear capabilities. Therefore, any nuclear threats regime leaders might choose to issue would likely be bluster. These dynamics would change, however, were the confrontation to occur closer to the adversary's home territory, where bringing U.S. force to bear might credibly threaten the regime. There, U.S. leaders would have to exercise more restraint and greater discretion in target selection.

Escalation management would also be possible were U.S. forces to intervene to defend a friendly regional state from a conventional invasion by a nuclear-armed adversary on its border. In such a scenario, the United States should bolster its deterrent capabilities by posturing ample airpower in the region close enough to support allied military operations against the adversary's invasion force, but beyond the range of the adversary's nuclear strike assets. U.S. leaders would issue assurances that they do not intend to threaten the regime, its leaders, or its nuclear capabilities, but warn them that their continued survival would depend on their not using nuclear weapons in any way that would damage property or harm people. To make these conditional

assurances credible, the United States should avoid deploying heavy ground forces in the region and striking targets on enemy soil; however, nuclear-capable bombers should be visibly deployed and put on patrol. U.S. conventional airpower could then support allied efforts to defeat the invasion, but when the tide of battle shifts against the adversary, enemy leaders should be allowed a face-saving way out of the conflict. The principal U.S. objective should be to compel them to return to the *status quo ante bellum*, and friendly states should be persuaded, via coercion if necessary, to desist from punishing the adversary or trying to establish a new status quo serving their interests at the adversary's expense.

Ultimately, the parametric analysis revealed that a probable breakpoint in escalation management is the compellence campaign. As previous studies have indicated, it is difficult to compel an adversary to change its behavior, even in the best of circumstances. Bombing campaigns have rarely succeeded when airpower was employed to impose punishment without also denying the opponent the ability to achieve its military objectives, and it would be difficult to devise a strategy for the latter when the opponent's objectives can be achieved via dispersed operations inside its own borders. More to the point, any strategy, whether based on punishment or denial, would likely require the sustained employment of airpower against targets in the adversary's homeland. Executing such a course of operations, along with the attack on the adversary's IADS that would be needed to enable it, would almost certainly cross a nuclear-armed opponent's critical escalation thresholds. Finally, while the analysis did devise a notional strategy based on using airpower to threaten regime stability, such an approach would be very risky and ill-advised unless very important U.S. interests were at stake.

5. Meeting the Challenge

As contours of the Second Nuclear Age emerge, probabilities grow ever greater that the United States will find itself in confrontation with emergent nuclear-armed regional adversaries. This research identified the dilemmas U.S. leaders would likely face in such confrontations, owing to the adversaries' ability to blur the nuclear threshold and the problems that might arise in relations with third parties in the region. We considered whether U.S. forces would be able to neutralize a regional opponent's nuclear capabilities during a crisis or war and assessed what conditions and capabilities would be required to execute such a strategy. Finally, we identified the circumstances in which the United States could manage escalation while defeating a nuclear-armed adversary in a conventional war and offered some general guidelines for developing strategies to do so.

Confrontations with nuclear-armed regional adversaries, should they occur, will be particularly dangerous and pose serious challenges to U.S. leaders. This chapter offers insights on how to meet those challenges. In it, we integrate the findings of previous chapters, make additional observations, and offer recommendations to the U.S. Air Force.

The Regional Nuclear Paradox

Should the United States find itself in confrontation with an emergent nuclear-armed regional adversary, U.S. leaders would likely want to pursue multiple objectives simultaneously. The adversary would probably have a history of rocky relations with the United States, having obtained its nuclear weapons in defiance of the Nuclear Non-Proliferation Treaty and the international arms control regime. Given that the United States would have chosen to militarily intervene in a regional crisis against such a state, that regime would almost certainly have attacked a regional friend or ally, or engaged in some other behavior detrimental to U.S. interests or abhorrent to U.S. values. In such circumstances, U.S. leaders would likely want to decisively defeat the regime's military forces, occupy its territory, remove its leaders from power, and replace them with a benign government more sympathetic to U.S. interests. To accomplish these objectives without incurring catastrophic costs or seeing them inflicted on allies or regional friends, U.S. forces would need to capture, destroy, or otherwise neutralize the regime's nuclear capabilities. U.S. leaders would also want to deter the adversary from using its nuclear weapons up to the point at which they are neutralized, and manage escalation while defeating its military forces and taking down its regime. *These objectives are not all mutually compatible, and some of them are probably not possible.*

The Incompatibility of Objectives

U.S. leaders cannot manage escalation while attempting neutralization, decapitation, or regime change. They should not expect enemy leaders to refrain from using every means at their disposal to ensure their survival and the survival of their regime in the face of a U.S. campaign to kill or remove them. Further, a principal reason hostile regimes are trying to obtain nuclear weapons is to deter or defeat U.S. efforts to remove them from power. So efforts to disarm the regime are tantamount to preparations for regime change. If not totally successful, they would likely trigger a nuclear response. Were the regime to have ballistic missiles or other means to deliver its weapons, it could use one or more of them on targets calculated to impose catastrophic costs on U.S. forces or their regional hosts, holding additional weapons in reserve to threaten targets of even higher value, should the United States continue the fight.

Therefore, the first question U.S. leaders must ask when contemplating strategies to neutralize an adversary's nuclear capabilities is this: What is the probability that the proposed operation can successfully capture, disable, or destroy all of the enemy's nuclear weapons—or at least enough that U.S. or allied defenses can defeat the few that survive—before any are launched or delivered by other means? Given the potential consequences of even a single nuclear weapon detonating on a friendly regional target, the probability of successful neutralization would have to be very high for a U.S. leader to authorize such a gamble, unless he or she were convinced that an enemy strike is imminent.

The Improbability of Successful Neutralization

As indicated in Chapter Three, achieving a high probability of successful neutralization would be highly unlikely were the opponent to have nuclear-armed ballistic missiles on TELs. In fact, it would be questionable even against an emergent nuclear power with only a handful of weapons not mated to missiles. For a neutralization strategy to be truly viable, several conditions would need to be present at once: The weapons would need to be held in nonhardened facilities; a splendid source of timely and highly reliable intelligence would need to reveal all of their locations precisely and convince U.S. leaders that those were indeed the only places where nuclear weapons were postured or stored; and strike assets would need to be immediately available for prompt employment.

Absent a serendipitous confluence of these circumstances, U.S. forces might be able to impose the blockade-and-dismember strategy discussed in Chapter Three, but U.S. leaders would be unlikely to authorize that without reliable commitments of vigorous support from all neighbors on the adversary's borders. Moreover, those neighbors would need to be able to effectively seal their borders with the adversary. Such conditions would not be attainable in confrontations with any states that have nuclear weapons today and would unlikely be attainable in confrontations with any states expected to have them in the foreseeable future.

In sum, U.S. military leaders should consider strategies aimed at disarming a nuclear-armed opponent and imposing regime change to be off the table unless the adversary crosses the nuclear threshold or U.S. leaders are convinced it is about to do so.

The Critical Importance of Escalation Management

With neutralization and regime change strategies off the table, escalation management is not just a desirable strategy, *it is the only strategy* that would allow the United States to defeat a nuclear-armed regional adversary in conventional war at acceptable costs, should doing so be necessary to protect U.S. interests. Therein lies the regional nuclear paradox. U.S. leaders might prefer to disarm and remove an aggressive nuclear-armed regime, but since they would be unable to do so, they would share an interest with that regime in preserving its survival so they could hold it hostage against the use of nuclear weapons. In fact, leaders on both sides—indeed, all actors in the region—would share two critical interests: preventing the use of nuclear weapons and preserving survival of the regime. U.S. leaders must understand that they cannot safeguard the former interest without respecting the latter one. More importantly, they would need to convince the adversary that they understand that. They would also have to convince regime leaders that they, in turn, would not be allowed the latter interest, their survival, unless they were to respect the former one, the non-use of nuclear weapons. Beyond that, U.S. leaders would need to convince any other powerful actors in the region who may be antagonistic to the nuclear-armed regime that they, too, would have interests in preserving its survival and not threatening its nuclear capabilities, and U.S. leaders would need to convince all regional friends and partners that the United States could protect them from the adversary's conventional and nuclear attacks.[1]

If Escalation Management Fails, a U.S. Nuclear Strike Could Be the Least Bad Option

In a twist of the regional nuclear paradox, reverting to a neutralization strategy using nuclear weapons might be the least bad option if escalation management fails. Should an escalatory chain reaction push the opponent to the nuclear brink, U.S. leaders could find themselves facing a decision on whether to launch a preemptive strike. To complicate matters further, were the adversary to nudge its way across the nuclear threshold, e.g., by conducting a nuclear test inside its country or a demonstration shot outside its borders during a crisis or conflict to communicate a threat, U.S. leaders would face an even greater challenge: They would need to find a response

[1] Our conception of a regional nuclear paradox is informed by Hans Morgenthau's identification of four nuclear paradoxes at the height of the Cold War. He maintained that, although the nuclear age comprised a novel period in history, as different from the age that preceded it as that age was from the Middle Ages, U.S. thoughts and institutions remained trapped in the bygone era. The contradiction between this mode of thought and objective reality created four paradoxes in U.S. nuclear strategy: "the commitment to the use of force, nuclear or otherwise, paralyzed by the fear of having to use it; the search for a nuclear strategy which would avoid the predictable consequences of nuclear war; the pursuit of a nuclear armaments race joined with attempts to stop it; the pursuit of an alliance policy which the availability of nuclear weapons has rendered obsolete." Hans J. Morgenthau, "The Four Paradoxes of Nuclear Strategy," *American Political Science Review*, Vol. 58, No. 1, March 1964, pp. 23–35.

that would punish the misbehavior in a way that is proportionate to the offense, while deterring further escalation. Finally, were the opponent to plunge over the brink, using one or more nuclear weapons in a way that significantly harms U.S. forces or regional targets, U.S. leaders would be confronted by the most onerous decision of all. In such a dilemma, no course of action would offer an appealing outcome, but a nuclear damage-limitation strike, or perhaps even a series of strikes, might be the least bad option. In any case, what course of action U.S. leaders should pursue on discovery that an adversary is about to cross the nuclear threshold or has done so already would depend not only on the adversary's behavior, but also on its capabilities.

An Adversary's Lack of Nuclear-Armed Missiles Would Probably Make Preemption Unnecessary

Preemption would probably be unnecessary when confronting a nuclear-armed adversary lacking the ability to deliver its weapons with ballistic missiles, even were the conflict to escalate significantly, prompting the enemy to brandish nuclear weapons. U.S. leaders should take such threats seriously to the extent that continuing to press a campaign that enemy leaders believe is seeking to disarm, decapitate, or remove them could force those leaders to lash out in desperation; however, limitations in their abilities to penetrate U.S.-controlled airspace to promptly deliver weapons on friendly targets would mitigate the dire urgency that might otherwise call for a U.S. preemptive attack. A more prudent option would be to issue stern conditional assurances that U.S. forces are not seeking regime change (but that the use of nuclear weapons would make regime destruction assured) and effect whatever adjustments in targeting and operations tempo are needed to make such assurances and counter-threats credible.[2]

An Adversary's Possession of Nuclear-Armed Missiles Would Probably Make Preemption Too Risky

Conversely, when confronting an adversary with nuclear-armed ballistic missiles, U.S. leaders probably would not risk preemption during a crisis or conflict, even were the United States to receive clear indications and warning that the adversary was about to launch a nuclear attack. Given U.S. desires to avoid the use of nuclear weapons, U.S. leaders' first impulse might be to launch a preemptive strike, raid, or campaign using conventional forces. However, they would soon realize that U.S. forces could not strike with sufficient speed, simultaneity, and probability of kill with conventional weapons alone to reduce the adversary's nuclear capabilities before it could launch its missiles. To maximize its effectiveness, a preemptive strike would have to be done with nuclear weapons, and even then there would be a significant risk that some number of TELs would not be found and destroyed before their missiles were launched.

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[2] This assumes, of course, that U.S. campaign objectives allow for such adjustments in targeting and operations tempo. As explained in Chapter Four, confrontations that do not credibly threaten regime survival are more easily managed than those that do. Some objectives, such as those that require disabling the adversary's IADS and repeatedly striking targets in its homeland, probably cannot be obtained with acceptable levels of risk.

This would be a Hobbesian trap in the purest sense. Given persuasive indications that the enemy were about to launch a nuclear strike, cold logic would dictate that the United States strike first, destroying as many enemy missiles as possible to limit damage to U.S. forces and other people in the region. Yet, were U.S. leaders to opt for preemption, they would bear the onus of ordering a nuclear first strike that would result in the deaths of thousands, including those friendly souls killed by the adversary's counterstrike should some of its missiles survive. Such an act would be legally justifiable, given the looming threat of the adversary's imminent attack, but the burden of proof that there was no other alternative would rest heavily on U.S. shoulders in the courts of domestic and world opinion.

Given the crushing weight of such responsibility, U.S. leaders would likely either flatly reject preemption or at least adopt a wait-and-see approach, hoping for the best. We suspect that, ultimately, they would procrastinate in making the decision until the opportunity for preemption had passed.

A Nuclear Demonstration or Attack on Infrastructure Would Call for a Measured Response

U.S. leaders would face a different kind of dilemma were the adversary to actually cross the nuclear threshold, but in a way that did not harm people directly. For instance, the regime could conduct a nuclear test to signal a threat, conduct a nuclear demonstration strike on an unpopulated target outside its territory, or explode a nuclear weapon in space or in the upper atmosphere to destroy infrastructure. U.S. leaders might respond to the least provocative of these options, a test detonation inside enemy territory, with threats and conditional assurances, while adjusting conventional operations to the extent needed to make assurances more credible. Similarly, a detonation outside the adversary's territory that did not harm people or property might be met with stern, explicit threats that any further use of nuclear weapons would result in catastrophic destruction. At the same time, U.S. leaders might also respond to the latter event with a concerted campaign to declare the regime an international pariah, cutting off all international political and economic discourse until regime leaders are removed from power.

However, any enemy use of a nuclear weapon to damage infrastructure would demand an immediate punitive response. U.S. leaders might answer an adversary's use of a nuclear weapon in space or in the atmosphere with a proportionately greater U.S. strike against enemy infrastructure, detonating a nuclear weapon over the adversary's military forces or one of its cities to damage them with EMP, while making it brutally clear that the United States would not answer tit-for-tat a second time; any further use of nuclear weapons would result in the adversary's annihilation.

A Nuclear Attack on U.S. Forces or Regional Targets Would Demand a Nuclear Response

A regional adversary's nuclear attack on U.S. forces or regional targets might leave U.S. leaders with no alternative but to conduct one or more counterforce strikes to limit the levels of damage the adversary could inflict in subsequent actions. A nuclear first strike on populated targets

would reveal that enemy leaders, for whatever reason—whether due to fear, miscalculation, loss of control of their forces, or pure ruthlessness—were either willing to take the lives of thousands of people or unable to stop their subordinates from doing so. Given such a precedent, U.S. leaders would be under enormous pressure to eliminate the enemy's ability to do further damage as soon as possible. Were they to not answer such an atrocity with a decisive reprisal, future U.S. nuclear threats would ring hollow, and extended deterrence commitments would be undermined. Other states in that region and elsewhere would then likely see no alternative but to develop their own nuclear deterrent forces, which could jeopardize regional stability even further.

U.S. leaders would be loathe to leave such a regime in power. Doing so would set a dangerous precedent, seriously damaging, perhaps fatally, the nuclear nonproliferation regime. Witnessing an emergent nuclear power devastate U.S. forces or a regional target and survive—i.e., seeing a nuclear midget force the most powerful nation on earth to back down in the face of a brutal act of defiance—would further incentivize other potential U.S. adversaries to pursue their own nuclear capabilities as proven insurance against future U.S. intervention and regime change. In sum, for future U.S. deterrent threats to have credibility and the nuclear arms control regime to remain viable, the world would need to see any regional adversary that were to resort to the use of nuclear weapons against people promptly destroyed.

As explained above, this could not be done with conventional arms alone, because the adversary could launch additional nuclear weapons while conventional capabilities were being brought to bear. Rather, the United States would need to strike as quickly and simultaneously as possible to destroy the regime and all known nuclear weapon–related assets and locations. To achieve the greatest possible speed and highest probability of kill, the initial strikes would need to be done with ballistic missiles, at least some of which would need to be nuclear-armed. Early strikes would also need to include IADS targets so U.S. ISR platforms and conventional strike aircraft could flow in to hunt down and destroy any remaining nuclear weapon–related targets and begin decimating conventional forces in preparation for the arrival of U.S. or allied ground forces.

One might question whether U.S. leaders would have the resolve to carry out such an operation, given the number of lives it would take and the millions more it would put at risk. Even a precisely aimed, discriminant counterforce strike would likely kill thousands of innocent civilians. Were the adversary to be equipped with mobile missiles on TELs, it would have flushed them to hide sites and firing positions by this time in the conflict, so there would be considerable risk that the first wave of U.S. counterforce strikes might not find and destroy them all before they launch strikes against additional U.S. or regional targets. Moreover, were the adversary to have some of its nuclear weapons or C2 centers in deeply buried, hardened facilities, as would probably be the case, then destroying them might require attacking in ways that would generate high levels of radioactive fallout that would contaminate neighboring states downwind. Some people would argue that no U.S. regional interests—not the continued viability of the nonproliferation regime, the credibility of U.S. extended deterrence commitments, or even

the United States' role as a global leader—are sufficiently important to warrant such costs and risks. That is for U.S. leaders to decide in the context of any particular challenge. But one thing we can say in advance: Should the United States find it necessary to confront an emergent nuclear-armed regional adversary, it will be critically important that U.S. forces have strategies for managing the escalation that could result. It is far better to recognize and avoid paths that could drive an opponent across the nuclear threshold than to deal with the consequences of uncontrolled escalation.

Crafting Strategies for Escalation Management

It is impossible to develop detailed operational plans for defeating nuclear-armed regional adversaries without first knowing what opponent the United States will need to confront over what interests and in what geostrategic context. Nevertheless, viewing the challenge through the threshold management framework allows us to develop guidelines for crafting escalation management strategies relevant across a range of crises and conventional warfighting scenarios. Following are guidelines for evaluating what escalation risks might be entailed in any prospective military operation and developing strategies for managing those risks.

Assess the Balance of Interests

Before confronting a nuclear-armed adversary, U.S. leaders need to soberly and objectively appraise what interests are at stake and consider whether they justify U.S. military intervention, with all the risks that would attend it. U.S. regional interests tend to revolve around safeguarding the security of allies and friends and maintaining the credibility of commitments to do so; preventing the proliferation of nuclear, biological, and chemical weapons and other dangerous substances and technologies; promoting respect for U.S. values, such as democracy and human rights; and maintaining U.S. influence more generally. While all of these interests might seem important in the abstract, experiences in Vietnam, Lebanon, Somalia, Iraq, and Afghanistan suggest that when U.S. forces begin taking more casualties than expected or a conflict lasts longer than anticipated, U.S. leaders and citizens alike tend to begin asking just what interests the United States really has in that conflict.

But just as importantly, U.S. leaders need to appraise the potential opponent's interests in the issue at hand and weigh them against those of the United States. Interests at stake in regional conflicts are invariably more central to belligerents that reside there than to the United States. That fact tends to make those belligerents more tolerant of potential costs and more committed to stay in the fight until its interests are secure. No state will be easily compelled to abandon interests that its leaders believe are tied to its (or their) security or economic well-being, and any opponent will escalate to whatever level of conflict it believes is necessary to ensure its survival. Interests tied to territorial claims, justifiable or not, and deep-seated historical grievances also

tend to generate powerful and enduring motivations, particularly when intensified by religious fervor.

While the United States can, to some extent, overcome a negative balance of interests with its positive balance of capability, U.S. leaders need to be cognizant of how asymmetries in both factors can affect escalation dynamics and thresholds.

Identify Each Side's Escalation Thresholds

When it appears that military action may be needed and crisis action planning begins, operational planners should do a careful analysis of each side's escalation thresholds. The assessment of the balance of interests discussed above would be an essential element of the threshold analysis, as thresholds are closely related to perceptions of interest. However, the threshold analysis would need to go much deeper, carefully examining each side's vulnerabilities, as determined by its capabilities, force posture, and the regional geography in context of what it would need to do to protect its interests and secure its military and political objectives. Understanding each state's core interests, those most closely tied to its survival, illuminates where its critical escalation thresholds will lie. Crossing those thresholds would almost certainly prompt opposing leaders to escalate the fight, believing their survival or the survival of their regime to be at stake.

In addition to identifying the adversary's critical thresholds, U.S. military planners should also assess where other escalation thresholds might reside, as part of a thorough intelligence preparation of the battlefield. Escalation thresholds derive from perceptions of interest and vulnerability; therefore, they depend heavily on each side's objectives, the correlation of forces, and the geography in which the conflict will be fought. As explained in Chapter Four, geography offers the most obvious pre-conflict indicators of where each belligerent's escalation thresholds might lie. National boundaries constitute formally established thresholds; crossing them is almost always regarded as escalatory, particularly when done so with conventional ground forces. Terrain features that offer natural defensive barriers, such as rivers and mountain ranges, can also be perceived as significant escalation thresholds if traversing them would render a belligerent more vulnerable to defeat. And, of course, weapon types and target sets can be organized into categories that suggest escalation thresholds. For example, all adversaries would consider shifts from the use of high explosives to incendiaries or from military targets to civilian targets as acts that cross escalation thresholds.

Finally, it is important to emphasize two points: First, planners should conduct careful threshold analyses on all parties that might be involved in the conflict, including the United States. U.S. leaders should give serious thought to what actions other actors might undertake that the United States would consider escalatory and why. Only with such conscious forethought can they inform adversaries of where important U.S. thresholds lie, forewarning them to avoid crossing them inadvertently, and fashion explicit or implicit threats to deter them from escalating the conflict deliberately. Second, threshold analysis should not end at the conclusion of campaign planning; rather, it should continue throughout the conflict, because perceptions of

what constitutes escalation thresholds and where geographically derived thresholds lie change with the ebb and flow of battle.

Tailor U.S. Military Objectives

Once each side's stakes and escalation thresholds are understood, military leaders can craft an operational plan that is sensitive to escalation management concerns—that is, one designed to secure U.S. interests, defeating the opponent's conventional military forces to the extent necessary, but doing so without crossing its critical escalation thresholds. The key to being able to inflict a conventional military defeat on a nuclear-armed adversary without triggering a nuclear response lies in keeping U.S. military objectives strictly limited. They must be tailored to securing the U.S. interests at issue, but go no further. The operational plan developed to obtain these objectives must respect the belligerents' common interests—i.e., keeping the conflict below the nuclear threshold *and* allowing survival of the opponent's leaders, regime, and nuclear deterrent capabilities. Only by preserving the opponent's higher-level interests can U.S. leaders hold them at risk as part of an escalation management strategy. As explained in Chapter Four, the United States must hold the regime hostage, with its continued survival conditioned on its leaders not resorting to the use of nuclear weapons.

As any conflict unfolds, events will invariably deviate from expectations, and plans and operations will have to be adjusted. The fortunes of war could go either way, but U.S. leaders must maintain a steady hand regardless. They should resist the temptation to escalate their political objectives in the flush of military success.[3] Conversely, in the event of serious setbacks, military leaders will want to increase their efforts to avoid defeat. This is permissible—indeed, the opponent will likely expect it—so long as such increases do not violate important escalation thresholds. Should it appear that defeat is unavoidable without a serious escalation, political and military leaders should assess the implications of such an escalation in terms of the risks involved and weigh them against the interests at stake before embarking down a path on which the potential costs might ultimately exceed the benefits of victory.

Plan for Conflict Termination

Before a conflict begins, U.S. leaders must anticipate that, sooner or later, the impending war will run its course and conflict termination will be within reach. Assuming that the operational plan has gone well and U.S. forces have achieved their military objectives, this point will be one of both opportunity and danger—the United States will be on the cusp of victory, but victory

[3] A sobering example of how escalating one's political and military objectives in the flush of success can trigger a dramatic and costly escalation is offered in Washington's decision to allow General Douglas MacArthur to take UN forces north of the 38th parallel in 1950 in an effort to reunite North and South Korea, only to trigger Chinese intervention and three additional costly years of war. For more on the importance of keeping objectives limited when facing a nuclear-armed adversary, see Fred Iklé, "Can Deterrence Last Out the Century?" *Foreign Affairs*, Vol. 51, No. 2, January 1973, pp. 10–11.

against a nuclear-armed adversary will only be attainable at affordable cost if opposing leaders are allowed a face-saving way out of the war with at least some of their important interests intact.

A humiliating defeat with the obvious loss of important national interests would threaten the stability of many governments. While the collapse of an adversary's autocratic regime might not be an unwelcomed development for U.S. leaders in itself, it could be so catastrophic for opposing leaders that prospects of it might drive them across the nuclear threshold to avoid accepting defeat in a war already lost on the conventional battlefield. U.S. leaders must remember that regime survival is an interest the United States shares with the adversary; for a hostage to have any coercive value, it must be kept alive.[4] Should the enemy government begin collapsing due to events beyond U.S. control, U.S. leaders should consider offering amnesty and safe passage to enemy leaders if they do not resort to the use of nuclear weapons in efforts to prop up their failed regimes. The United States would, in this circumstance, hold their personal survival, as opposed to regime survival, hostage against the use of nuclear weapons and potentially in exchange for their assistance in securing those weapons to prevent them from falling into even more dangerous hands in the failed state.

With these thoughts in mind, U.S. leaders need to consider, even before a conflict begins, what interests they can allow opposing leaders to retain, and they should watch for opportunities to allow them options for settlement, or "off-ramps," at every stage of the crisis or conflict.[5] The extent to which such options favor each side's interests, ranging from true compromise solutions on the one hand to offers of mere physical survival at the other extreme, will depend on the relative bargaining positions of the belligerents based on military outcomes, the stability of the regime, and the behavior of enemy leaders up to that point. Nevertheless, exit options are hard to conjure up at the last minute and should therefore be planned and the groundwork laid for them in advance.

Manage Third-Party Expectations, Fears, and Behaviors

As discussed in Chapter Two, any U.S. military operation against a nuclear-armed regional adversary would have serious implications for other states in the region. U.S. forces would almost certainly need the cooperation of one or more regional partners in terms of access and overflight permission and potentially other forms of support. Cooperating with the United States could put those states at risk. Conversely, U.S. leaders might also want one or more other states with significant military capabilities to remain uninvolved if those states are historical enemies

[4] Schelling, 1966, pp. 6, 191.

[5] This is not to suggest that U.S. leaders should approach regime leaders with settlement offers at any stage of a confrontation or conflict. Such actions could make the United States appear weak or irresolute, thereby encouraging the adversary to continue resistance or increase its demands in settlement negotiations. Rather, the United States should focus on defeating the adversary and securing U.S. interests. U.S. leaders should, however, be alert for indications that opposing leaders are looking for a way out of the confrontation or conflict and be open to negotiation, should the regime signal its desire to end the crisis.

of the nuclear-armed adversary, or at least coordinate their actions with those of the United States, lest they act independently in ways that escalate the crisis or conflict. These considerations would be especially important should any third-party state also have nuclear weapons.

To obtain the cooperation of third-party states in whatever form is required, U.S. leaders will need to reassure them that the United States can protect them from the nuclear-armed adversary and will remain committed to doing so regardless of how the crisis or conflict develops. To make such assurances credible, the United States will need to posture forces and capabilities to defend these states to the extent possible. However, given the improbability that they can be provided leak-proof defenses against all the ways an adversary could attack them with nuclear weapons, the principal form of protection will ultimately have to be deterrence. U.S. leaders will need to explicitly threaten the adversary that the United States will exact serious retribution for any attack on other regional actors. U.S. leaders may need to posture defensive systems and U.S. forces in third-party states to add credibility to both its reassurances and deterrent threats to the extent that political, tactical, and logistical considerations make such options practical.

Discouraging a nuclear-armed adversary's historical enemies from acting independently might be the most difficult challenge for U.S. leaders if these states have significant military capabilities. Meeting that challenge will be particularly important if they also have nuclear weapons. Depending on geography, the correlation of forces, and political relationships between these states and other regional actors, U.S. leaders may seek one of several possible levels of involvement from them, ranging from total neutrality to active participation in a military coalition against the regional adversary. In any case, it would be unrealistic to expect a powerful state to not respond if attacked by the nuclear-armed adversary.[6] However, U.S. leaders should try to discourage such states from launching any preemptive attack, conventional or nuclear, and, if drawn into the war, at least coordinate their military operations with those of the United States.

Were the involvement of other powerful states to appear desirable or unavoidable, ideally, U.S. leaders and military planners would meet with their counterparts and emphasize not only their mutual interests, but also those they share with the adversary (i.e., not crossing the nuclear threshold and not threatening the adversary's survival). U.S. planners should share the findings of the threshold analysis and seek agreement from their counterparts regarding military objectives, where important escalation thresholds lie, and what levels of escalation would be

[6] A notable example of a state showing remarkable restraint under attack is provided in the first Gulf War, when Israel did not counterattack after Iraq began launching Scud missiles at it. Knowing that an Israeli attack would have caused Arab states to leave the U.S.-led coalition (which is why Saddam Hussein ordered the attacks), U.S. leaders rushed Patriot missile batteries to Israel as reassurance of U.S. commitments to defend it and convinced Tel Aviv to remain on the sideline. However, it was a close decision there. According to Israeli sources, had Iraq armed its missiles with chemical weapons, Israel would likely have struck back. See Joel Brinkley, "War in the Gulf: Israel; Israelis Say Their Patience with Scud Attacks Is Thin," *New York Times*, January 30, 1991; Avi Shlaim, "Israel and the Conflict," in Alex Danchev and Dan Keohane, eds., *International Perspectives on the Gulf Conflict, 1990–91*, London: St. Martin's Press, 1994, pp. 59–79.

acceptable and desirable in the imminent or ongoing conflict. In addition, they should seek mutual agreement on what deterrent threats and assurances should be issued to the adversary and what force postures and messaging strategies would be most effective in making those threats and assurances credible.

Deploy Forces to Stabilize the Crisis or Prevail in War

At some point in the course of operational planning, the United States would begin deploying military forces to the region to stabilize the crisis and, if necessary, engage in combat to defend U.S. interests and regional friends. Based on historical experience, force deployment could begin early in the planning process; therefore, it would be important for U.S. leaders to take crisis stability and escalation management concerns into account from the very beginning, to minimize the risk that forces might be inadvertently deployed in a posture that exposes them to preemption or creates undue escalatory pressures.

The objective of posturing forces during a confrontation would be to stabilize and defuse the crisis if possible while preparing to fight a war should crisis management efforts fail. In most scenarios, this would require deploying forces in a way that deters the opponent from launching a conventional attack on U.S. interests or regional friends.[7] Unlike nuclear deterrence, which relies on explicit or implied threats to punish a nuclear attack with a costly counterstrike, conventional deterrence relies more on building defenses and posturing military forces in ways that cause the opponent to doubt its attack would be successful, thereby making futile any costs it would pay in attempting it.[8] Therefore, deploying U.S. forces to stabilize a crisis would require positioning them in a way that communicates the capability and resolve to defeat the opponent's conventional attack. However, the deployment should minimize those forces' exposure to the threat of a conventional or nuclear preemptive strike, and it should not make the opponent so fearful that the United States is about to launch a surprise attack that it feels compelled to strike first for its own survival.[9]

If a conflict has already begun, the objective would be to posture forces in a manner that best supports the accomplishment of campaign objectives without generating excessive pressures for escalation or unduly exposing U.S. forces to a nuclear strike. As previously mentioned, U.S. leaders should avoid deploying heavy ground forces close to the opponent in ways that suggest

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[7] As mentioned in Chapter Four, scenarios in which U.S. forces would initiate the attack, such as compellence campaigns, would require posturing U.S. forces in a way that deters the opponent from launching a preemptive attack.

[8] Glen Snyder was first to make this distinction, in his book *Deterrence by Denial and Punishment*, Princeton, N.J.: Center of International Studies, 1958. Thomas Schelling is probably the best known of the many theorists who focused on deterrence via threats of punishment. John Mearsheimer did the seminal work on the importance of denying the enemy success in its military strategy in conventional deterrence. See Schelling, 1966; and John J. Mearsheimer, *Conventional Deterrence*, Ithaca, N.Y.: Cornell University Press, 1983. Also see Karen Ruth Adams, "Attack and Conquer? International Anarchy and the Offense-Defense-Deterrence Balance," *International Security*, Vol. 28, No. 3, Winter, 2003/2004, pp. 45–83.

[9] Morgan, 2013, pp. 27–32.

the United States is preparing to execute a campaign aimed at regime change. Beyond that, if the adversary's capabilities are sufficiently developed that it possesses nuclear-armed missiles, U.S. leaders should posture their air, ground, and naval assets beyond the range of those weapons to the greatest extent possible, while still retaining sufficient combat capability to achieve campaign objectives.[10]

Sharpen the Brink with Threats and Conditional Assurances

As the confrontation develops, U.S. leaders should communicate with opposing leaders to clarify where critical U.S. escalation thresholds lie and inform them that they will face dire consequences if they violate them. At the same time, however, they should assure those leaders that the United States and its allies will respect their critical thresholds—i.e., they will not attempt to remove or decapitate the regime, nor will they attack targets associated with the opponent's nuclear deterrent forces—if U.S. thresholds are respected. The objective in these communications would be to sharpen the blurry nuclear threshold. U.S. leaders can determine the specific details of where to draw the line only in the context of a specific confrontation, but the foregoing analysis suggests that regime leaders should be informed that any use of a nuclear weapon that harms people or damages property would result in their destruction. In essence, U.S. leaders would use conditional assurance to reestablish a nuclear brink on which to hold the opponent's regime hostage.[11]

There are a variety of ways to communicate such threats, along with the assurances they underwrite. Each has advantages and disadvantages. U.S. leaders might choose to communicate publicly, via pronouncements made in speeches, press conferences, or official press releases. Such public diplomacy offers the advantage of making the message more credible in that they create "audience costs" for U.S. leaders should they renege on promises or back down from threats;[12] however, U.S. leaders might see that as a disadvantage for the same reason.[13] Public

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[10] One way to think about how to posture air assets is to calculate their *potency* when operating from alternative bases. Potency is a measure of how much conventional force a strike asset can bring to bear in support of deterrent threats or warfighting campaigns. As elaborated in a previous RAND research project, a strike asset's potency is a calculation that incorporates several factors: the mass of ordnance it can deliver on specified targets over time, a function of payload and sortie rate; its range in terms of how far its weapons can reach into contested airspace; the persistence with which it can threaten targets, a function of sortie rate and loiter time; the persistence with which it can press an attack, a function of sortie rate, weapon load, rate of expenditure, and loiter time; its ability to penetrate defenses, a function of speed, stealth, and countermeasures; and the hard-target kill capabilities of the weapons it can deliver, a function of weapon size, precision, and design. See Morgan, 2013, pp. 103–104.

[11] This should not be confused with the Cold War strategy, "brinkmanship," which involved convincing the adversary that both sides were dangerously close to a nuclear brink and it had better back away lest some accident cause events to spiral out of control and drag them both to nuclear war. For more on brinkmanship, see Schelling, 1966, pp. 99–105. Also see Robert Powell, "Nuclear Deterrence Theory, Nuclear Proliferation, and National Missile Defense," *International Security*, Vol. 27, No. 4, Spring 2003, pp. 86–118.

[12] James D. Fearon, "Domestic Audience Costs and the Escalation of International Disputes," *American Political Science Review*, Vol. 88, No. 3, September 1994, pp. 577–592.

[13] Scott D. Sagan, "The Commitment Trap: Why the United States Should Not Use Nuclear Threats to Deter

threats also tend to humiliate opposing leaders, which can, in turn, provoke public defiance in efforts to save face, and they might present regime leaders openings to use "salami tactics" to erode threat credibility.[14]

Private communications avoid these pitfalls to some extent, but they have other weaknesses. A threat delivered in private does not humiliate the threatened party as much, but it may not be taken as seriously because that party knows the one issuing the threat can back down without public embarrassment. Moreover, when leaders keep communications private in efforts to avoid censure from domestic audiences, adversaries can inflict political costs on them by making them public, or they can seek coercive leverage by threatening to do so.[15] There are practical problems as well. The United States might not have diplomatic relations with the regime it is confronting, making it difficult to arrange a private meeting between key representatives. U.S. leaders could work through unofficial third parties, such as people with business interests in the opposing country, or use the "good offices" of leaders from a disinterested third-party nation to relay messages, but doing so risks the messages not being communicated accurately or perhaps not being communicated at all.[16]

How U.S. leaders ultimately choose to communicate their assurances and deterrent threats will depend on the nature of regime leaders and the context of the specific crisis. To corroborate these assurances, as previously explained, the United States should deploy its forces in ways that signal that it is not posturing to carry out regime change. However, to underscore the deterrent threat, U.S. leaders could visibly deploy nuclear-capable bombers to bases within striking distance of the opponent's territory, but outside the range of enemy strike assets, and begin conducting periodic patrols nearby. They could then adjust the frequency and locations of these

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Biological and Chemical Weapons Attacks," *International Security*, Vol. 24, No. 4, Spring 2000, pp. 85–115; Scott D. Sagan, "The Madman Nuclear Alert: Secrecy, Signaling, and Safety in October 1969," *International Security*, Vol. 27, No. 4, Spring 2003, pp. 150–183.

[14] Salami tactics involve committing a series of increasingly provocative acts that do not individually justify punishment to gradually undermine the threat of it. They blur the starkness of a threshold by making the act that ultimately crosses it seem to be but a minor escalation over the previous infraction, which was not punished. See Schelling, 1966, pp. 66–67.

[15] Keren Yarhi-Milo, "Tying Hands Behind Closed Doors: The Logic and Practice of Secret Reassurance," *Security Studies*, Vol. 22, No. 3, 2013, pp. 405–435.

[16] For instance, in 1953 President Dwight Eisenhower attempted to issue a nuclear threat to China through third parties in an effort to compel Beijing to enter an armistice agreement ending the Korean War. He reportedly had the message delivered at the Panmunjom Truce talks, had Secretary of State Dulles deliver it to India's Prime Minister Jawaharlal Nehru, passed it through a confidential "contact" in Hong Kong, and asked Jiang Jieshi and the government of Taiwan to deliver the message. Because an armistice agreement was reached soon afterward, Western diplomatic scholars long believed that the nuclear threat was instrumental in bringing it about. However, more recent scholarship has questioned whether any of these messages were delivered. In particular, Nehru, the primary channel of delivery, later "categorically denied that he ever passed any nuclear threat on to the Chinese." See Tong Zhou, "Nuclear Signaling and China's Perception about Nuclear Threat: How China Handled Nuclear Threats in the Cold War," Atlanta, Ga.: Sam Nunn School of International Affairs, Georgia Technical University, undated, pp. 5–6; Roger Dingman, "Atomic Diplomacy During the Korean War," *International Security*, Vol. 13, No. 3, Winter, 1988–1989, pp. 50–91.

patrols, along with increases and decreases in DEFCON, to modulate levels of deterrent threat as needed in support of broader strategies for crisis diplomacy or escalation management.[17]

Tune the Strategy During Execution

Escalation management strategy development does not end at the conclusion of operational planning, force deployment, or even the communication of threats and conditional assurances. Like all branches of strategy, escalation management is a dynamic process that must be adjusted to accommodate the unforeseen developments that invariably arise in confrontations and conflicts against intelligent, adaptive adversaries. As forces engage and advantages shift, new vulnerabilities emerge for one belligerent or another, prompting recognition of new escalation thresholds or heightened sensitivity to existing thresholds. U.S. forces will need to continuously collect information, interpret these changes, and make any necessary adjustments to operations to avoid inadvertently crossing thresholds that could trigger escalatory chain reactions. At the same time, U.S. leaders will need to update implicit and explicit threats to warn adversaries not to cross U.S. thresholds inadvertently and deter them from doing so deliberately. All the while, U.S. commanders will need to tune and enforce rules of engagement to minimize the risks of U.S. forces falling prey to escalatory accidents; they will also need to recognize that isolated incidents of enemy provocation might not be deliberate and modulate their responses to those events accordingly.

Nevertheless, accidents and inadvertent events invariably occur in the fog and friction of war. Should U.S. forces stumble across an opponent's escalation threshold, U.S. leaders will have to promptly assess the potential impacts of the error and take whatever actions are needed to mitigate its escalatory effects. Such actions might include informing the adversary that the particular act was unauthorized and will not be repeated. U.S. leaders might also need to temporarily reduce the tempo of operations, pare down target lists, or pull nuclear bomber patrols back to reassure enemy leaders of their intent to keep the war limited. Alternatively, U.S. leaders might choose to deal with some accidents by issuing new threats or re-posturing forces in efforts to deter the adversary from escalating in response to them. There might even be situations in which U.S. leaders would choose to use both approaches—inform regional actors that a certain attack by U.S. forces was accidental and also warn opposing leaders that they had better not escalate in response. But in some cases, U.S. leaders will simply have to accept the fact that the adversary will likely escalate after a U.S. accident. If so, they will need to establish a new upper-escalation threshold and resolve to fight on to victory, albeit at higher costs. As Clausewitz argued, friction in war is an inescapable reality. Only practice, experience, and the unrelenting will of a competent commander can overcome it.[18]

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[17] Morgan, 2013, pp. 79–80.

[18] Clausewitz, 1976, pp. 119–121.

Putting These Observations in Today's Geostrategic Context

Although the focus of this study has been exploratory and theoretical, the implications are relevant to specific geostrategic challenges faced by the United States today, and most of the findings would be applicable in confrontations with the emergent nuclear-armed regional adversaries it might face in the near future. Of particular concern to U.S. policymakers are North Korea, an adversary with a nuclear arsenal the size of which may have already exceeded what we would describe as "emergent," and Iran, which, given its leaders' apparent determination to develop nuclear weapons in defiance of U.S. nonproliferation policies, may soon be considered an emergent nuclear-armed adversary of the United States.

Both of these cases exhibit characteristics consistent with those discussed in the balance of interests and escalation thresholds sections above. Although the United States has very important interests in both Northeast Asia and Southwest Asia, U.S. stakes would almost certainly be less than either of these states would perceive their own to be in any serious military confrontation with U.S. forces. Paramount among Washington's many interests would be protecting U.S. forces, U.S. persons, and U.S. allies, partners, and friends in each region, respectively; Pyongyang and Tehran, however, would likely see a direct military confrontation with the United States (or with a neighbor whose relationship with Washington could result in U.S. intervention) as a serious threat to their survival. As a result, their territorial boundaries would constitute critical escalation thresholds, and any strikes on their IADS, C2, or nuclear forces and infrastructure would likely result in rapid escalation. Given the erratic behavior the leaders of these states often exhibit, their potential concerns about the vulnerability and reliability of their nuclear arsenals, and the questionable maturity of their nuclear strategies and doctrines, such escalation could get out of control very quickly.

Yet, when one considers these characteristics in light of the geostrategic challenges explored in this study, it seems probable that observations made in at least two of the three theoretical cases would hold true with North Korea and a nuclear-armed Iran. Given the overwhelming naval superiority that the United States and its allies enjoy, any maritime confrontation with either of these opponents would likely be deterred or resolved in favor of the United States without serious risk of escalation, assuming it takes place well outside their territorial waters and that sufficient U.S. or allied forces could be brought to bear in a timely manner.[19] On the other extreme, any effort the United States might make to compel either of these adversaries to change their behavior by engaging in a concerted bombing campaign against targets in their home territories would almost certainly result in nuclear brandishing and encounter serious risks of rapid, catastrophic escalation. However, it is the middle case—the one in which U.S. forces are

[19] Although not a maritime confrontation in the global common, an example of a confrontation with a North Korean vessel that did not extend Pyongyang any credible escalation options occurred in July 2013, when Panama seized a North Korean cargo ship and arrested its crew after discovering it was carrying undeclared missile components through the Panama Canal en route to Cuba. See "North Korean Ship with Military Cargo Held by Panama," BBC News, July 13, 2013.

required to defeat an adversary's invasion of a neighboring state—that entails escalation risks that are so contextually dependent.

This is especially true on the Korean peninsula, where North Korean conventional forces are massed just north of the Demilitarized Zone (DMZ) and poised to range Seoul with heavy artillery and rocketry. Should this unresolved, half-century-old conflict reignite in open conventional war, Seoul would undoubtedly take heavy damage and might be overrun in a North Korean armored offensive, unless South Korean and U.S. forces were to quickly seize or regain the initiative and drive into the North. Such an allied offensive would require taking down North Korea's IADS and striking second-echelon forces and other military targets in the southern portion of North Korea.[20] These actions would alarm Pyongyang, especially were North Korean leaders to realize that their own offensive had failed and perceive that their defenses are collapsing. Their alarm might turn to panic were U.S. and South Korean airpower to begin striking targets farther north, particularly C2 targets in and around Pyongyang or those associated with the control of nuclear forces. Any of these developments could prompt North Korean leaders to cross the nuclear threshold, and the latter ones would be especially dangerous.

These conditions make this study's observations salient, but the operational realities render some of its recommendations moot. For instance, analysis of the conventional invasion case in Chapter Four resulted in recommendations that the United States avoid posturing heavy ground forces in territory contiguous to a nuclear-armed adversary in a crisis or advancing with such forces across enemy borders should a conflict occur. These recommendations were aimed at increasing stability during crises and reducing pressures for escalation during conflicts, by both building credibility in conditional assurances that U.S. objectives do not include regime change and by minimizing exposure of U.S. forces to preemptive nuclear or conventional attack. But avoiding such a posture is not possible in Korea, where U.S. and South Korean conventional forces are already concentrated in close proximity to North Korean forces just across the DMZ. Even more troubling are occasional references in the open media suggesting that, should conventional war erupt in Korea, U.S.–South Korean Combined Forces Command (CFC) would consider carrying out preemptive strikes on North Korean nuclear weapons and missile sites and launching an offensive into North Korea, with the intension of eliminating the Pyongyang regime once and for all.[21] Should CFC forces attempt preemption or route the North Korean army and plunge north, Pyongyang would almost certainly use nuclear weapons in a last-ditch effort to save the regime.

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[20] "What Happens If North Korea Gets Out of Hand? Here Are Some Scenarios," *NBC News*, April 4, 2013; Andrew Salmon, "Korean Nightmare: Experts Ponder Potential Conflict," *CNN World*, March 27, 2013.

[21] In February 2013, the Chairman of South Korea's Joint Chiefs of Staff informed the National Assembly that South Korean forces would preempt if a North Korean attack appeared imminent (Salmon, March 2013). Also see Keir A. Lieber and Daryl G. Press, "The Next Korean War: Conflict With North Korea Could Go Nuclear—But Washington Can Reduce the Risk," *Foreign Affairs*, April 1, 2013; Zachary Keck, "U.S.- S. Korea Military Gameplan," *The Diplomat*, April 4, 2013.

The geography is not as constraining, nor is the correlation of forces as volatile or inflexible, in Southwest Asia as on the Korean peninsula, but instabilities and dangerous escalation dynamics could emerge in military confrontations and conventional wars with a nuclear-armed Iran. The United States has security commitments to several states in this region, which have required it to base sizable air and land forces within range of Iranian ballistic missiles. Moreover, vital international shipping routes through the Persian Gulf, the Gulf of Oman, and the choke point between them, the Strait of Hormuz, offer convenient high-value fulcrums of coercive leverage that Tehran could threaten during a crisis. Any Iranian attempt to close those shipping routes or attack vessels traversing them could provoke U.S. or third-party attacks on targets on Iranian soil, which could result in escalation. Fortunately, U.S. forces are not massed on the Iranian border. In fact, the size of the U.S. footprint in the region has been declining in recent years and may continue to do so in the future. More importantly, perhaps, Iran's most dangerous regional adversary, Israel, does not share a contiguous border with it.

These factors would allow Tehran and other regional actors more time for decisionmaking in a military crisis than Pyongyang and Seoul would have, making pressures for escalation and risks of miscalculation less intense. Nevertheless, they could still be significant in many scenarios, given the bombastic threats that Iranian leaders have made and Israel's history of resorting to preventive strikes on regional nuclear facilities and preemptive attacks on enemy conventional military forces during crises. Additionally, Iran's use of proxy forces in hybrid warfare in several regional conflicts threatens stability in Southwest Asia, just as North Korea's periodic artillery bombardments on South Korean–held islands, attacks on South Korean naval vessels, and provocations along the DMZ threaten stability in Northeast Asia.

This points to another element common to the Northeast and Southwest Asia cases that is consistent with an observation made in this study. One of the most important factors in efforts to stabilize crises as they flare up and manage escalation in those that result in war in both of these regions will be U.S. leaders' ability to dampen the escalatory impulses of their regional allies. Limited provocations must be met with stern but limited responses that are proportionate to the intensity of the provocation and geographically contained to avoid threatening the adversary's regime survival or nuclear forces. U.S. leaders will need to reassure regional partners that the United States can and will come to their assistance in the event of a major war, but condition such reassurance on their not acting independently in ways that risk catastrophically escalating any particular crisis or conflict.[22] This assumes, of course, that U.S. leaders understand the need for restraint and have developed (or are willing to develop) plans with regional partners for military options that are truly limited. *This is an essential point that must not be lost: An adversary's possession of even a few nuclear weapons makes it imperative that war be limited in*

[22] Israeli researchers anticipated such constraints in a 2012 study they conducted in which they simulated a nuclear confrontation between Israel and Iran. See Yoel Guzansky and Yonathan Lerner, *Iran: A Strategic Simulation*, The Institute for National Security Studies, Jaffee Center for Strategic Studies, Tel Aviv University, Israel, January 2012.

objectives, means, intensity, and scope. Regime change is off the table, unless U.S. leaders are willing to shoulder the costs in blood, treasure, and political censure of provoking nuclear strikes on military and civilian targets in the region, those belonging not only to the United States, but to other friendly nations as well.

Recommendations for the U.S. Air Force

When in confrontation with a nuclear-armed regional adversary, decisions about whether to try to neutralize its nuclear capabilities or employ conventional force to defend U.S. interests are the responsibility of political and joint military leaders, as is strategy development for accomplishing these critical tasks. Nonetheless, there are important steps the U.S. Air Force can take to support these functions more effectively. We offer the following recommendations:

Organization and Equipment

Although political leaders are unlikely to allow U.S. forces to try to neutralize a regional adversary's nuclear capabilities, the Air Force should continue devoting a portion of its budget to research and development on capabilities to do so, to the extent that such capabilities also support other missions. There is always a chance that, during a crisis or conflict, intelligence could reveal a fleeting opportunity to disable or destroy a regional adversary's emergent nuclear capabilities. More importantly, should enemy leaders demonstrate a wanton disregard for human life by employing one or more nuclear weapons, U.S. leaders might conclude they have no alternative but to disarm the adversary to limit its ability to cause more damage. In addition, the Air Force may need to invest in greater capability to conduct conventional strike operations from afar, in order to defeat a nuclear-armed regional adversary's conventional forces while operating from bases beyond the range of its conventional and nuclear strike capabilities. To organize and equip the force for these tasks, we recommend the following:

Recommendations

1. Continue research and development on methods and capabilities to find, fix, track, attack, and assess enemy nuclear weapons capabilities. Explore approaches for defeating each element of the enemy's nuclear weapons delivery enterprise, then selectively invest in developing capabilities that are affordable and appear most promising. Ideally, those chosen for development could also make substantial contributions to other important missions.
2. Continue research and development on ballistic and cruise missile defense systems, methods, and concepts. Emphasis should be placed on developing systems that are rapidly deployable, adapted to the threat systems typically fielded by nuclear-armed regional adversaries, and affordable enough that they can be postured in sufficient numbers to make sizable contributions to meeting the neutralization challenge.
3. Conduct research on whether and how to rebalance the force to better enable posturing airpower to conduct conventional strike operations from afar, in order to defeat a nuclear-

armed regional adversary's conventional forces while operating from bases beyond the range of its conventional and nuclear strike capabilities.

Doctrine, Education, and Training

As the Second Nuclear Age unfolds, there is an ever-growing risk that the United States will find itself in confrontation with nuclear-armed regional adversaries. Despite the foregoing recommendation, in most of these confrontations, and perhaps even all of them, it is highly improbable that U.S. forces will be able to neutralize the opponents' nuclear capabilities. Consequently, if the United States is to protect its regional interests when challenged by these opponents, U.S. leaders and forces will need strategies that enable them to manage the risks of escalation when confronting regional adversaries with conventional force.

Air component commanders and their staffs play essential roles in developing prospective courses of action, evaluating them, and conducting operational planning. Therefore, they have a responsibility to advise joint commanders and policymakers on what escalation risks prospective courses of action present and offer recommendations for managing those risks. To prepare airmen for these roles and responsibilities, we recommend the following:

Recommendations

1. Revise Air Force doctrine to better acknowledge the risks of escalation and the importance of managing it. Doctrine should stress knowing the political limits of conflict and understanding why those limits are important. It should explain the concept of escalation thresholds and emphasize understanding the enemy's critical thresholds and how they can change over the course of the conflict. It should further explain that, in limited war, airmen will need to apply airpower in ways that obtain U.S. military and political objectives without driving the enemy over critical escalation thresholds.
2. Train air component commanders on the principles of escalation management. Revise the air component commander training course to include instruction on the concept of escalation thresholds, the motives and mechanisms of escalation, and the importance of understanding the balance of interests. Commanders should be trained in how to apply threshold management concepts in operational planning.
3. Emphasize escalation management in Air Force schools. Provide all Air Force officers a firm grounding in the concept of limited war, the risks of escalation in the Second Nuclear Age, and the principles of threshold management. These topics should be stressed in professional military education programs and at the School of Advanced Air and Space Studies, and they should be emphasized in war games and exercises.

Appendix A. The Second Nuclear Age

Over the past two decades, changes in the global distribution of nuclear weapons and the characteristics of both arsenals themselves and the states possessing them have led a number of observers to identify a "Second Nuclear Age."[1] The distinction between a First and a Second Nuclear Age—corresponding to the Cold War and post–Cold War nuclear security environments—has become a useful way to capture the important qualitative changes that have taken place in the latter years of the 20th century, and the implications these changes will have for U.S. military strategy. In this appendix, we provide definitions for these two nuclear ages, identify the principle characteristics that distinguish them from one another, and discuss some of the broad security implications that result from the transition from the First Nuclear Age to the Second.

Defining the First and Second Nuclear Ages

As is the case with all analytic constructs used to describe real-world processes and events, there is necessarily some ambiguity in defining the First and Second Nuclear Ages. There is no sharp breaking point between the two. Roughly, the two are equated, respectively, with the Cold War period dominated by the U.S.-Soviet nuclear competition, and the post-Cold War period characterized by the proliferation of regional nuclear threats and the shift from a bipolar to a multipolar distribution of power.

Although scholars differ over how to define and distinguish the two nuclear ages, there is a rough consensus about several trends that have changed—and are likely to continue to change—the nature of the nuclear threat environment the United States faces in the post–Cold War era. In particular, the Second Nuclear Age differs from the First Nuclear Age according to six broad criteria:

- the number of nuclear-capable actors
- the diversity of these actors' characteristics
- an increasingly regional strategic orientation among nuclear actors

[1] Colin Gray is generally credited with first using the term "Second Nuclear Age." For works on this topic, see Keith B. Payne, *Deterrence in the Second Nuclear Age*, Lexington, Ky.: University of Kentucky Press, 1996; Colin S. Gray, *The Second Nuclear Age*, Boulder, Colo.: Lynne Rienner, 1999; Paul J. Bracken, *The Command and Control of Nuclear Forces*, New Haven, Conn.: Yale University Press, 1983; Bruce Jones, Carlos Pascual, and Stephen John Stedman, *Power and Responsibility: Building International Order in an Era of Transnational Threats*, Washington, D.C.: Brookings Institution Press, reprint edition, July 28, 2010; Michael S. Gerson, "Conventional Deterrence in the Second Nuclear Age," *Parameters*, Vol. 39, No. 3, 2009; Robert P. Haffa, Jr., Ravi R. Hichkad, Dana J. Johnson, and Philip W. Pratt, "Deterrence and Defense in 'The Second Nuclear Age,'" Northrop Grumman Analysis Center Paper, March 2009; and Victor Cha, "The Second Nuclear Age: Proliferation Pessimism Versus Sober Optimism in South Asia and East Asia," *Journal of Strategic Studies*, Vol. 24, No. 4, 2001.

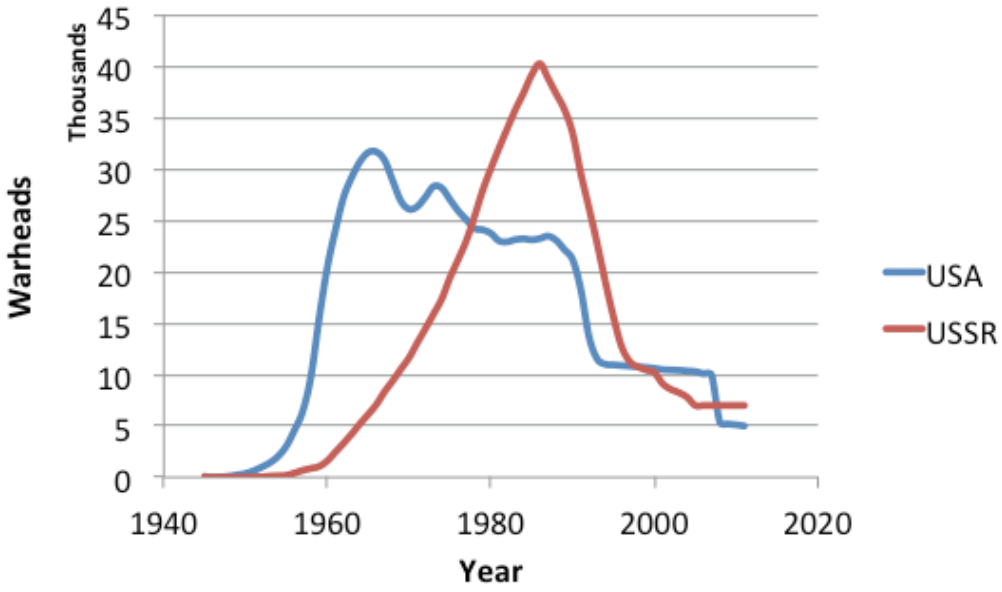
- substantial asymmetries of capabilities and interests between the United States and emerging nuclear actors
- decreasing U.S. reliance on nuclear weapons for security
- greater opportunity to acquire nuclear weapons and technologies without great-power assistance.

Because these changes have been taking place gradually over time, there is no clear, bright line to separate the First and Second Nuclear Ages. In fact, as can be seen in Figure A.2, the number of nuclear weapon states has more or less steadily increased over time since the atomic bomb was first developed in 1945. There are several events, however, that demonstrate a qualitative shift in the structure of the nuclear balance toward the end of the 20th century. First, as is demonstrated in Figure A.1, the end of the Cold War in the 1980s triggered a long-term decline in the size of the two dominant nuclear arsenals.[2] Second, the Indian nuclear test in 1974 signaled a change in the course of nuclear proliferation by demonstrating that regional powers could acquire a nuclear capability without the purposeful assistance of the great powers. Third, the Israeli attack on Iraq's Osirak nuclear facility in 1981 and the development of the Indian-Pakistani nuclear rivalry in South Asia showed how nuclear competitions could take place in a regional rather than a global context, independent of great-power rivalries. Finally, the 1991 Gulf War and the 1991–1994 North Korean nuclear crisis demonstrated how the United States itself could become embroiled in a regional conventional military dispute in which nuclear weapons were relevant.

Taking these events as key harbingers of change, we can identify a First Nuclear Age that extends from the 1940s until the end of the Cold War, a Second Nuclear Age that begins with the end of the Cold War and continues into the present, and a transitional period in which the two overlap that runs from the 1974 Indian nuclear test until the North Korean crisis in the early 1990s. This transition is illustrated in Figure A.2.

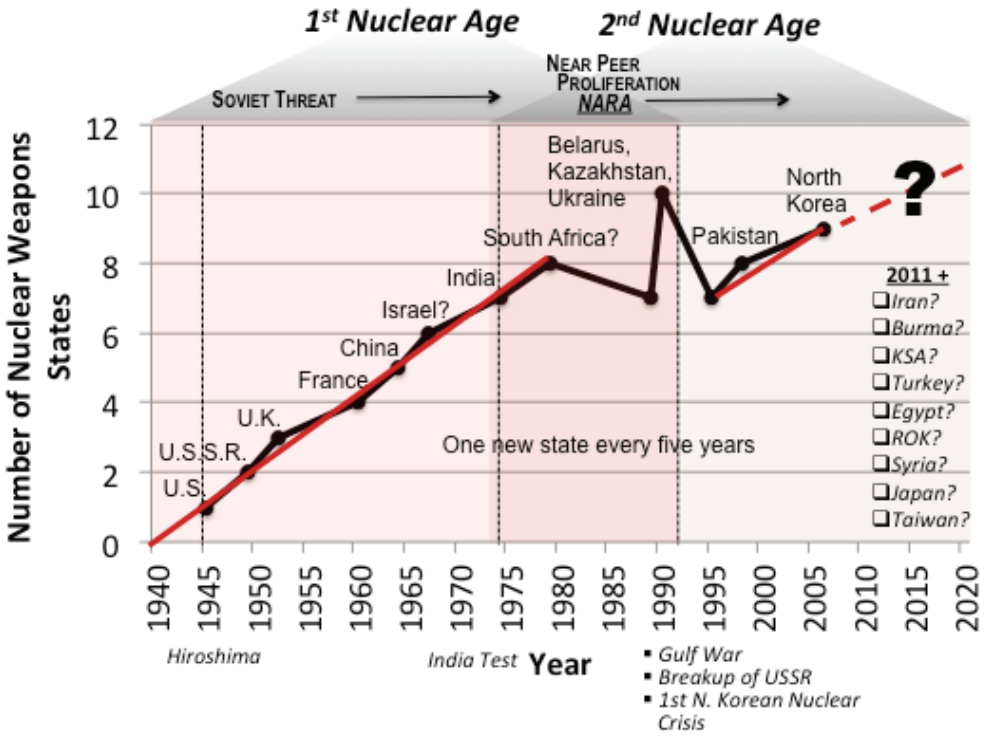
[2] The total number of Soviet warheads rose steadily until 1986, then began a long-term decline. Soviet strategic warheads peaked in 1989. The U.S. arsenal size peaked in 1966, then declined largely due to reductions in nonstrategic warheads. The U.S. strategic arsenal peaked at a plateau of roughly 15,000 warheads between 1973 and 1988, then began a long-term decline. Data are from the Natural Resources Defense Council.

Figure A.1. Total Warheads in U.S. and Soviet Nuclear Stockpiles, by Year



SOURCE: National Resources Defense Council.

Figure A.2. The First and Second Nuclear Ages



SOURCE: Bulletin of Atomic Scientists.

More Nuclear Actors

In the Second Nuclear Age, the United States will have to contend with a larger and potentially increasing number of nuclear-capable actors. To date, ten states have developed nuclear weapons; nine of these continue to possess them.[3] South Africa is the only state to have ever developed nuclear weapons and later renounce them. An eleventh state, Iran, currently stands at the nuclear threshold. Although there is debate over whether more states will acquire nuclear weapons in the future, the history of nuclear weapons proliferation provides little reason for optimism in this regard. The number of nuclear weapon states has increased with relative consistency over time, at a rate of approximately one new nuclear power every seven years. While international efforts to stem this spread have had some important successes, there have also been notable failures, such as North Korea's development of the bomb. It is far from inevitable that the number of nuclear weapon states will continue to grow. However, the United States already faces a world in which there are a sizable number of regional nuclear powers. The growth of illicit trade networks in nuclear and ballistic missile technology, the demonstrated willingness of states such as North Korea to transfer these technologies, and failure of the international community to prevent states such as North Korea and Iran from acquiring sensitive nuclear and missile technologies all provide good reasons to suspect that past proliferation trends could continue. Global climate change and the world's growing energy requirements could create additional challenges for the international nonproliferation regime, should this prompt renewed interest in nuclear power.

Greater Diversity of Nuclear Actors

During the First Nuclear Age, the nuclear competition with the Soviet Union was the paramount security threat to the United States. Only to a lesser extent was the spread of nuclear weapons to other states—or to nonstate actors—a major strategic concern, and this was largely set within the context of the bipolar strategic balance.[4] This was the case with China, which was the only nuclear-armed adversary apart from the USSR itself that the United States faced during the Cold War.

While the nuclear balance between the two dominant nuclear powers continues to be a primary element of the Second Nuclear Age threat environment, it is no longer the only one. The United States has, since the end of the Cold War, faced a growing number of states with nuclear weapons or with nuclear ambitions. These states vary in terms of their arsenal size and

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[3] The following states have tested nuclear weapons: USA (first test 1945), USSR (1949), UK (1952), France (1960), China (1964), Indian (1974), Pakistan (1998), and North Korea (2006). Israel possesses nuclear weapons but has not publicly acknowledged its arsenal. South Africa developed nuclear weapons, then gave up its stockpile. Iran has an active and sophisticated nuclear program, and is suspected of having nuclear weapon ambitions.

[4] Concern over the possibility of a nuclear terrorist attack can be traced back to the earliest days of the nuclear era. See Jeffrey Richelson, *Defusing Armageddon: Inside NEST, America's Secret Nuclear Bomb Squad*, New York: W.W. Norton & Co., 2009.

sophistication, their delivery capabilities, and their overall economic and military power. They also have different regime types and different relationships with the United States. Some, such as North Korea and Iran, are U.S. adversaries. Unlike the near-parity that existed between the superpowers, the United States will enjoy substantial conventional and nuclear superiority over emerging regional nuclear powers.

In the Second Nuclear Age, there is also the greater risk of a nonstate actor acquiring a nuclear weapon and having the means and the will to use it against U.S. interests. Nuclear terrorism has always been a concern; however, the danger has grown considerably, from the existence of poorly secured nuclear arsenals and materials in states such as Russia and Pakistan, and from the emergence of nuclear-armed states in which there may be problems with arsenal stewardship.

Growing Nuclear Regionalism

As nuclear weapons spread to regional powers, and while the dominant nuclear powers continue to deemphasize their own nuclear arsenals, issues of nuclear competition and deterrence will increasingly shift from a global to a regional focus. This will also affect the nature of states' arsenals, as there will likely be an increased emphasis on short- and intermediate-range delivery systems.

Nuclear proliferation may also produce a growing number of regional nuclear rivalries. The world has already seen the rise of one regional nuclear rivalry, between India and Pakistan, and will likely see more over the coming decades. The United States' role in these rivalries may be complicated: In the India-Pakistan case, for example, the U.S. plays no clearly adversarial role toward either side. As a result, U.S. strategy in these cases cannot be satisfactorily informed by constructs such as extended deterrence.

Asymmetries of Interest and Capabilities

During the First Nuclear Age, relative military parity existed between the United States and the Soviet Union. Also, the two superpowers were largely divided over issues in which each side had a vital stake, such as the disposition of postwar Europe. Paradoxically, the fact that both sides had such strong interests in contested areas such as Europe allowed for greater stability, as the strength of those interests helped to make deterrent threats more credible.

Confrontations with emergent nuclear powers will have a decidedly different character than the Cold War competition with the Soviet Union. They will typically be characterized by asymmetries in both military capabilities and interests. It is unlikely that nuclear-armed regional adversaries will challenge the United States on its home territory, or even outside of the their own region. Instead, conflicts with these states will likely stem from the projection of U.S. power into their own region. While the United States may be pursuing important regional interests, such as the defense of key regional allies, it is unlikely such a confrontation would present the United States with an existential threat. These regional confrontations would be of America's choosing.

The opponent, however, may very well perceive such a confrontation as a fight to the death. As a regional power rather than a global one, it would have a much stronger interest in the outcome of any regional struggle than would the United States. Furthermore, the regional power's leadership could perceive defeat as tantamount to death if it suspects that the United States intends to effect regime change, or that any concessions made to the United States could so weaken the regime's domestic legitimacy that it could fall from power.

Decreasing U.S. Reliance on Nuclear Weapons for Security

In the 2010 Nuclear Posture Review, the Obama administration has made clear its intent to continue to reduce its reliance on its nuclear stockpile for its security, and to decrease the roles for these weapons.[5] To a growing degree, U.S. conventional military forces will likely assume tasks once reserved for the nuclear arsenal. This is particularly the case with the deterrence of regional nuclear powers, as the nuclear arsenal is too blunt an instrument for the delicate task of maintaining stability in regions with one or more minor nuclear powers.

The Obama administration has also brought the issue of nuclear disarmament back to a prominent place on the international agenda by declaring that the United States considers the eventual elimination of nuclear weapons an important long-term goal.[6] The New START treaty was touted as a step toward that goal, and it is likely that further cuts in strategic arms will follow. The U.S. and Russian drawdown in nuclear forces, occurring at the same time as a continued buildup in forces by other nuclear-armed states, will likely further the shift in strategic emphasis toward regional nuclear actors and away from the U.S.-Russian nuclear balance.

Greater Opportunity to Acquire Dangerous Technologies

The A.Q. Khan network's sale of fuel-cycle and nuclear weapon technology to a number of countries, and the existence of nuclear and ballistic missile technology-sharing networks among states such as North Korea, Iran, and Syria illustrates the proliferation challenges presented by illicit networks. In the First Nuclear Age, the dominant nuclear powers largely functioned as the gatekeepers for these technologies. This is no longer so. To adapt to this challenge, the United States will need to continue to build international cooperative arrangements and improve its ability to detect these networks through quality intelligence and interdiction of technology transfers.

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[5] U.S. Department of Defense, 2010.

[6] See The White House, "Remarks by President Barack Obama, Hradcany Square, Prague, Czech Republic," Washington, D.C.: Office of the Press Secretary, April 5, 2009.

Comparing the First and Second Nuclear Ages

The interaction of these factors has generated dynamics in the relations between nuclear states in the Second Nuclear Age that are qualitatively different from those witnessed in the First Nuclear Age. These differences are summarized in Table A.1.

Table A.1. Comparison of First and Second Nuclear Ages

First Nuclear Age*	Second Nuclear Age
Global nuclear competition	Regional nuclear competition
Bipolar dominance of a P-5 nuclear club	Range of nuclear actors acting largely independently
Symmetries of interest	Asymmetries of interest
Relative symmetries in capability (and in response to hostile actions)	Marked asymmetries in capability (and in response to hostile actions)
Fear of existential threat	Fear of isolated nuclear events
Stable mutual deterrence (large, relatively invulnerable arsenals)	Less stable deterrence (small, potentially vulnerable arsenals)
State-dominant communication channels	Competition for communication (24-hour news, new media)
Conflict between nuclear states fought with conventional proxies	Direct conventional conflict between nuclear states
Stable regime as an enduring adversary	Unstable regimes as transitory adversaries
Relatively deep understanding of the adversary	Crisis de jour understanding of adversary
Tight control over nuclear arsenals	Varying levels of control over arsenals, materials, and technologies
Perceptions characterized by overconfidence	Perceptions characterized by fear of uncertainty

* More characteristic of conditions after the post Cuban missile crisis than early in the Cold War.

Security Implications of the Second Nuclear Age

Events from the past few years have highlighted some of the ways in which the changing global security environment is altering the dynamics of nuclear weapon security and deterrence:

- instability in Pakistan and growing concern that Islamist extremists might control elements of the country's military and intelligence agencies
- the rapid growth of Pakistan's nuclear arsenal, which may soon become the world's fourth-largest
- further progress in the Iranian nuclear program, and revelations about past nuclear efforts in Syria
- North Korea expanding its missile cooperation to numerous countries, and the revelation of a North Korean industrial-scale uranium enrichment facility
- further reductions to the U.S. nuclear arsenal under the New START Treaty

- President Obama's announcement in Prague that the United States will work toward nuclear disarmament, and the U.S. commitment in the Nuclear Posture Review to further reduce strategic reliance on the nuclear stockpile.

These examples illustrate many of the ways in which the strategic challenges of the Second Nuclear Age differ from those of the First Nuclear Age. As it continues to pursue critical interests in regions around the world, the United States will increasingly risk encountering a military confrontation with a nuclear-armed regional adversary. It is therefore imperative for the United States to develop strategies that will allow it to successfully pursue its goals while preventing escalation across the nuclear threshold.

Appendix B. The Inadequacy of Cold War Concepts

Since the end of World War II, the United States has relied on deterrence to protect itself and its allies from attack during peacetime or escalation during war. Deterrence entails discouraging an opponent from attacking or escalating by threatening to punish it for doing so, posturing capabilities to deny its success, or both, so that the opponent concludes that the costs of the attack or escalation would probably outweigh any benefit gained by it. Washington first threatened nuclear massive retaliation to offset Soviet conventional superiority and deter Moscow from attacking Western Europe. As Soviet nuclear capabilities began to rival those of the United States, U.S. theorists developed concepts for managing confrontations between the superpowers and strategies for containing escalation should those crises erupt in war. As we shall explain in this section, however, while Cold War deterrence theories were sound, U.S. political leaders did not find Cold War approaches to escalation management acceptable even then.

Given the characteristics of nuclear-armed regional adversaries, the risk of future confrontations with them is substantial. Should such a confrontation occur, U.S. leaders would want to keep any resulting conflict below the nuclear threshold. Unfortunately, Cold War–era approaches for managing escalation are even less adequate for containing conflicts with regional adversaries with emergent nuclear capabilities than they were for dealing with the Soviet Union.

The "Absolute Weapon," Massive Retaliation, and Limited Nuclear War

When the United States used atomic bombs to end World War II in 1945, U.S. leaders considered those weapons to be simply more powerful ordnance. But as postwar investigators learned more about the extent of destruction wrought on the cities of Hiroshima and Nagasaki, it became apparent that atomic bombs were weapons in a totally different class from anything used before. The following year, RAND analyst Bernard Brodie published his now classic book, *The Absolute Weapon: Atomic Power and World Order*, in which he argued that atomic weapons were so potentially devastating that they would change the very nature of war.[1]

It was this destructive power that President Dwight Eisenhower had in mind when he promulgated his "New Look" policy, which relied on strategic nuclear weapons to deter conventional and nuclear threats from the Eastern Bloc. In January 1954, Secretary of State John Foster Dulles unveiled this new policy in a speech in which he said, "Local defenses must be reinforced by the further deterrent of massive retaliatory power," and that in order to deter aggression, the free community would have to be "willing and able to respond vigorously at

[1] Bernard Brodie, *The Absolute Weapon: Atomic Power and World Order*, New York: Harcourt Brace, 1946.

places and with means of its own choosing."[2] Although Dulles did not make the threat explicit, the implication was clear: the United States would answer any Soviet attack with nuclear *massive retaliation*.

Almost immediately, this policy came under fire. A threat of massive retaliation might be credible in response to a nuclear attack, but would Moscow believe the United States would really respond to a conventional invasion with nuclear weapons, knowing that it too had nuclear weapons with which to answer such an escalation? More seriously, how could the United States make a threat of massive retaliation credible in response to minor provocations? These questions were raised in a series of scholarly books and articles published in the mid-1950s, which proposed that strategies incorporating measured reprisals would have to be developed and limited nuclear war contemplated to make deterrent threats credible.[3]

Yet these arguments only raised more doubts. If the United States used limited nuclear strikes to blunt a Warsaw Pact invasion of Western Europe, why would Moscow not respond with its own limited nuclear strikes to return the advantage to its superior conventional forces? Would the United States then escalate its nuclear strikes and risk an even greater escalation from the Soviets? Where would it end? Given these considerations, would limited nuclear war even be possible?[4]

Herman Kahn and Escalation Dominance

Despite growing skepticism in academic and professional circles, RAND analyst Herman Kahn argued that limited nuclear threats could be made credible, nuclear wars could be fought and won, and escalation could be controlled.[5] Kahn proposed that the United States could keep wars limited by achieving what he called *escalation dominance*. To explain his concept, he described escalation in terms of a metaphorical "escalation ladder" with each rung representing a different level of intensity in the confrontation or conflict.[6]

In Kahn's conception, escalation dominance describes "a capacity, other things being equal, to enable the side possessing it to enjoy marked advantages in a given region of the escalation ladder."[7] It is a condition in which one has the ability to escalate a conflict in ways that would be

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[2] John Foster Dulles, "Massive Retaliation," speech to the Council on Foreign Relations, January 12, 1954.

[3] See, for instance, William W. Kaufman, ed., *Military Policy and National Security*, Princeton, N.J.: Princeton University Press, 1956; Henry A. Kissinger, *Nuclear Weapons and Foreign Policy*, New York: Harper and Row 1957; Morton Kaplan, "The Calculus of Deterrence," *World Politics*, Vol. 11, No. 1, October 1958, pp. 20–43.

[4] Albert J. Wohlstetter, *The Delicate Balance of Terror*, Santa Monica, Calif.: RAND Corporation, P-1472, November 6, 1958, revised December 1958; Bernard Brodie, *Strategy in the Missile Age*, Princeton, N.J.: Princeton University Press, 1959, pp. 335–357.

[5] See Herman Kahn, *On Thermonuclear War*, Princeton, N.J.: Princeton University Press, 1961; Herman Kahn, *Thinking about the Unthinkable*, New York: Horizon Press, 1962; and Herman Kahn, *On Escalation: Metaphors and Scenarios*, New York: Praeger, 1965.

[6] Kahn, 1965, p. 39.

[7] Kahn, 1965, p. 290.

disadvantageous or costly to the enemy, while the enemy could not do the same in return, either because it has no escalation options or because those available to it would not improve its situation. Once enemy leaders realized one had achieved escalation dominance, they should be deterred from taking the conflict to a higher rung where they would suffer greater costs with no comparable advantage. In fact, once escalation dominance is achieved, the threat of further escalation should become a particularly powerful coercive lever for bringing the enemy to favorable terms.[8]

While Kahn's approach to escalation management is perfectly rational in an abstract sense, it suffers from several serious defects when one attempts to apply it in real-world strategy making. First, the escalation ladder metaphor bears only a passing resemblance to the dynamics of actual conflict. It suggests that escalation occurs in discrete steps, observable to both sides; that the belligerents share a common perception of where each of them is standing on the ladder at any given time; and that they have sufficient control of their forces to move up or down the ladder at will. Empirical studies of crisis and war since Kahn developed his ideas have revealed that such assumptions are unrealistic. Confrontations between dangerous states are fraught with uncertainty, misperception, and miscalculation.[9] Second, the ladder metaphor suggests that escalation occurs along but a single dimension, vertical, i.e., increases in the intensity of conflict. In fact, escalation can occur along multiple dimensions, including horizontal and political. Finally, true escalation dominance is rarely attainable in any challenging confrontation. It was clearly not attainable between the superpowers during the Cold War. Even given the dramatic asymmetries of power between states in the post–Cold War world, most enemies will always have some ability to escalate along one or more dimensions.[10]

Thomas Schelling and Brinkmanship

Thomas Schelling, a noted economist and pioneer in the use of game theory for strategy development, proposed that crises and conflicts between nuclear-armed adversaries were actually contests of coercive diplomacy in which tacit bargaining was a central feature. Because neither opponent could achieve victory at an affordable cost should the contest turn into a nuclear conflagration, both shared a common interest in keeping the confrontation below the nuclear threshold. That shared interest provided a space in which they could engage in coercive

[8] Byman and Waxman, 2002, p. 40. Also see Byman, Waxman, and Larson, 1999, pp. 30–36.

[9] A great deal of research was done during the Cold War on the risks of misperception. Some of the more notable works of that era include Fred Iklé, "Can Nuclear Deterrence Last Out the Century?" *Foreign Affairs*, Vol. 51, No. 2, January 1973, pp. 267–285; Robert Jervis, *Perception and Misperception in International Politics*, Princeton, N.J.: Princeton University Press, 1976; Robert Jervis, "Deterrence and Perception," *International Security*, Vol. 7, No. 3, Winter 1982–1983, pp. 3–30; Lebow, 1984, pp. 101–228.

[10] For a closer look at these problems, see Morgan et al., 2008, pp. xiv–xv, 15–17, 34–36.

bargaining, each using threats and limited applications of force to pursue its objectives at the other's expense.[11]

Unlike Kahn, who made insufficient allowance for the possibilities of misperception and lack of control, Schelling made uncertainty a virtue. He argued that since nuclear-armed opponents shared the risk of escalation, one could manipulate that risk to advantage by demonstrating that he was willing to escalate the conflict in a way that might get out of control if the adversary did not comply with coercive demands. The opponent most committed to taking the confrontation to the brink of nuclear war by binding himself to irreversible action and using "the threat that leaves something to chance" would win this contest of brinkmanship by forcing the adversary to back down to avoid catastrophe.[12]

Schelling's approach was more realistic than Kahn's in that it acknowledged the uncertainties present in confrontations between states, but brinkmanship shares some of escalation dominance's defects and also exhibits other limitations. Like Kahn, Schelling envisioned the dynamics of escalation mostly in one-dimensional terms and occurring in a contest between two opponents relatively symmetrical in capability. These shortcomings limit the concept's utility in a world in which multiple potential adversaries, widely disparate in power, are emerging. But brinkmanship is limited even as a means of managing vertical escalation against a single opponent. Envisioned principally for managing confrontations approaching the nuclear threshold, it provides little guidance for managing escalation in conflicts well below that threshold or those that have moved above it. In essence, to employ brinkmanship as a means of escalation management, one would have to deliberately take the confrontation or conflict to the brink of nuclear war.

Strategy in the Era of Mutual Assured Destruction

Although U.S. and Soviet behavior in the Cuban missile crisis exhibited elements of brinkmanship, the dangers encountered in that episode so frightened both sides that they were disinclined to engage in such high-stakes games ever again. Military leaders continued planning for conventional and nuclear war throughout the remainder of the Cold War, but political leaders had little interest in engaging in direct confrontations, much less issuing threats that might leave something to chance. Instead, the predominate means of escalation management employed by both sides during the remainder of the Cold War became the avoidance of direct superpower conflict.

This caution deepened as both sides realized they had built themselves into a condition of mutual assured destruction (MAD). As both sides then possessed large, dispersed arsenals able to survive a nuclear first strike, neither could launch a nuclear attack on the other without incurring

[11] Thomas C. Schelling, *The Strategy of Conflict*, Cambridge, Mass.: Harvard University Press, 1960, pp. 53–80; Schelling, 1966, pp. 1–34 and 131–141.

[12] Schelling, 1966, 92–125.

an unacceptable level of damage in return. At that point, crisis stability assumed paramount importance in U.S. strategic thought, and maintaining nuclear parity through arms control became U.S. strategic goals. Although Soviet leaders never embraced the concept of parity-based stability, they too realized that no attack could be made without receiving unbearable losses in return.[13]

During the final decade of the Cold War, U.S. analysts debated whether countervalue or counterforce targeting was the preferable nuclear strategy. If MAD made successful nuclear war impossible, then logic suggested that nuclear weapons should be aimed at the opponent's cities instead of threatening its strategic forces, which might be destabilizing in a crisis. But critics argued that targeting cities was immoral, and the threat of countervalue strikes lacked credibility against limited attacks. Deterrence could still fail, and if it did the United States would need to strike Soviet nuclear forces, eliminating as many of them as possible to limit the damage they might inflict on the U.S. homeland.[14]

This debate was never resolved. With the end of the Cold War, deterrence concerns faded. The demise of the Soviet Union left the United States as the sole remaining superpower, able to create a "new world order" and impose its will on any state that might oppose it . . . or so U.S. leaders thought.[15]

Why Cold War Strategies Are Inadequate

Stability in the Cold War was largely a result of the rough symmetry between the United States and the Soviet Union. In the early years, U.S. nuclear power offset Soviet conventional power, but it is important to remember that Soviet conventional power was a powerful deterrent against the United States as well, and this reassured Moscow. In the latter half of the Cold War, both sides' survivable second-strike capabilities imposed stability on the relationship. Those stabilizing factors are now largely absent.

Today, the United States is vastly superior to almost all other states, both conventionally and in nuclear arms. This condition, coupled with the characteristics typical of regional nuclear power in the Second Nuclear Age, introduces new, potentially dangerous dynamics in future confrontations. Nondemocratic, regime-centric governments dissatisfied with the status quo are

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[13] See John G. Hines, Ellis M. Mishulovich, and John F. Shull, *Soviet Intentions 1965–1985*, Volume I: *An Analytical Comparison of U.S.-Soviet Assessments During the Cold War*, McLean, Va.: BMD Federal, Inc., September 22, 1995, pp. 11–13.

[14] While these comprised the main points of each side's arguments, the debate was much more complicated than we can relate here. For more on the countervalue position, see Robert Jervis, *The Illogic of American Nuclear Strategy*, Ithaca, N.Y.: Cornell University Press, 1984; and Charles L. Glaser, *Analyzing Strategic Nuclear Policy*, Princeton, N.J.: Princeton University Press, 1990. For the counterforce argument, see Colin S. Grey and Keith Payne, "Victory Is Possible," *Foreign Policy*, No. 39, Summer 1980, pp. 14–27.

[15] See, for instance, "The Month That Shook the World," *The New York Times*, September 2, 1990; George H. W. Bush, "Address Before a Joint Session of the Congress on the Persian Gulf Crisis and the Federal Budget Deficit," Washington, D.C., September 11, 1990.

likely to come into confrontation with the United States. When that occurs, the United States will need to deter them from escalating the conflict, while *compelling* them to change their behavior or incur some act of aggression. The asymmetry of interests in these confrontations may make these actors more risk tolerant and committed to having their way, deepening antagonism with the United States and making them harder to deter and compel. At the same time, leaders of emergent nuclear states are likely to be particularly fearful, given the United States' daunting military superiority, doctrines emphasizing deep strike and strategic paralysis, and track record of imposing regime change on regional adversaries. Fear and nuclear immaturity could result in opponent misperception, miscalculation, and rapid escalation or preemption.

Historical approaches to escalation management were inadequate in the Cold War and will be even less suitable for managing conflicts with nuclear-armed regional adversaries. Cold War deterrence, based almost exclusively on nuclear threats, may lack credibility against nonpeer competitors. Cold War approaches to escalation management—escalation dominance and brinkmanship—were deemed too risky then, so political leaders of that era retreated into conflict avoidance. But conflict avoidance in the Second Nuclear Age would amount to abandoning important U.S. interests when challenged by a regional power with nuclear weapons. That is unacceptable. Complicating matters, U.S. leaders now want to reduce the role of nuclear weapons in international security affairs.

As the above discussion reveals, the challenge of potential enemies with emergent nuclear capabilities is much different than that which the United States encountered during the Cold War. While deterrence theory is still the prevailing strategic framework, deterring emergent nuclear powers will require a different set of options than did deterring the Soviet Union. This evolution is particularly evident in the unique set of conflict dynamics and dilemmas the United States will encounter when involved with a crisis or conflict with a nuclear-armed regional adversary.

Abbreviations

BMD	ballistic missile defense
C2	command and control
CAS	close air support
DEFCON	defense readiness condition
EMP	electromagnetic pulse
IADS	integrated air defense system
IRBM	intermediate-range ballistic missile
ISR	intelligence, surveillance, and reconnaissance
LOC	line of communication
MRBM	medium-range ballistic missile
OCA	offensive counterair
PAF	RAND Project AIR FORCE
PGM	precision-guided munition
RFID	radio frequency identification
SEAD	suppression of enemy air defenses
SOF	special operations forces
TEL	transporter-erector-launcher
UAV	unmanned aerial vehicle

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