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EXTENDED DETERRENCE IN THE SECOND NUCLEAR AGE

GEOPOLITICS, PROLIFERATION, AND THE FUTURE OF U.S. SECURITY COMMITMENTS

EVAN BRADEN MONTGOMERY

FOREWORD BY ERIC S. EDELMAN

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Foreword

Eric S. Edelman

Few issues have preoccupied and perplexed U.S. officials as much as extended nuclear deterrence. Throughout the Cold War, the twin demands of discouraging aggression by an incredibly powerful adversary and assuring vulnerable frontline allies presented enormous diplomatic and military challenges. Nevertheless, successive generations of academics, analysts, and practitioners rose to meet them. The questions they debated were the stuff of nightmares. The answers they proposed left many uncomfortable. And the policies they adopted were often controversial. Yet they helped to ensure that the "long twilight struggle" proclaimed by John F. Kennedy would eventually be remembered as the "long peace" described by John Lewis Gaddis.

The past twenty-five years have offered a much-welcomed respite from Cold War-style strategic dilemmas. To be sure, the United States has continued to face a variety of nuclear dangers. Despite Washington's ongoing efforts, nuclear material, technology, and weapons have spread to the Indian subcontinent, the Korean Peninsula, and the broader Middle East. That, in turn, has raised the specter of regional conflicts between nuclear-armed rivals, coercive threats by nuclear-armed rogues, and devastating attacks by nuclear-armed terrorist groups. During this period, however, U.S. policymakers rarely worried about the United States becoming directly involved in a massive nuclear conflict or allies losing faith in American security commitments and striking out on their own.

As a number of senior officials have begun to note, however, the United States is entering an era of renewed great power competition. That includes competitions with potential adversaries such as Russia and China that are steadily upgrading their own nuclear arsenals as we struggle to preserve our own. Meanwhile, North Korea's fourth nuclear test (with another in prospect as this is written) and Iran's recent missile launch are potent reminders that the types of nuclear threats that have dominated the post-Cold War landscape have not gone away.

What will a world of great power competition and nuclear proliferation look like, and what will it mean for the United States as a global security provider and the chief underwriter of international order? As this report explains, policymakers in Washington might soon have to

grapple with a host of worrisome possibilities: crisis instability in Europe, the further spread of nuclear weapons in East Asia, and other nations extending their nuclear umbrellas into the Middle East. Avoiding these outcomes, all of which could endanger U.S. interests, will require fresh thinking about extended nuclear deterrence—thinking that draws on well-established insights and adapts them to the challenges of today.

Unfortunately, nuclear deterrence no longer occupies the prominent intellectual place it once enjoyed. The subject is no longer a staple of academic research, debate, and instruction. Consequently, as the Defense Science Board noted in 2008, the nation's nuclear deterrence skills have seriously deteriorated since the end of the Cold War. But there is room for optimism; a new generation of strategists is beginning to pay careful attention to this topic and lay the intellectual foundation necessary to help policymakers, legislators, and military officers manage the difficult times ahead. I believe the ideas, analysis, and recommendations that Evan Montgomery presents in this report will contribute to this increasingly important goal and help inform a more thoughtful public debate about the relevance and continued importance of assuring our friends and allies, thereby helping to deter prospective nuclear conflicts around the world.

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CHAPTER 1

The Rise, Decline, and Revival of Extended Nuclear Deterrence

For more than seventy years, the protection of allies from external threats has been a core element of American grand strategy and a major driver of U.S. military planning.[1] During the Cold War, the United States formed defense pacts with dozens of countries throughout the world and provided informal security assurances or guarantees to a number of others. Many of these commitments still remain in effect, even if the circumstances that originally made them necessary no longer obtain. Washington has taken on more security obligations in the post-Cold War era, thanks mainly to the expansion of the North Atlantic Treaty Organization (NATO), and there is always the possibility that it could shoulder additional burdens in the future, particularly if new dangers emerge.[2]

Today, the United States continues to underwrite regional stability in the three geographic areas that have long been the principal focus of American strategists and defense planners. In Europe, it is responsible for helping the twenty-seven other members of NATO guard against a resurgent Russia, which is enhancing its military capabilities, expanding its territorial boundaries, and engaging in renewed brinkmanship with the West. It also maintains a network of bilateral alliances across the Asia-Pacific, which could be tested if an increasingly powerful

1 Other core tenets of American grand strategy include preventing hostile actors from dominating critical regions, preserving freedom of the global commons, and working through institutions to sustain a liberal international order. For discussions, see John Lewis Gaddis, *Strategies of Containment: A Critical Appraisal of Postwar American National Security Policy* (New York: Oxford University Press, 1982); G. John Ikenberry, *Liberal Leviathan: The Origins, Crisis, and Transformation of the American World Order* (Princeton: Princeton University Press, 2011); and, most recently, Stephen G. Brooks, G. John Ikenberry, and William C. Wohlforth, "Don't Come Home, America: The Case against Retrenchment," *International Security*, 37, No. 3, Winter 2012/13, pp. 7–51.

2 For a tally of U.S. security commitments across the globe, see Michael Beckley, "The Myth of Entangling Alliances: Reassessing the Security Risks of U.S. Defense Pacts," *International Security*, 39, No. 4, Spring 2015, pp. 22–24.

China attempts to dominate the region by force or a fragile but volatile North Korea lashes out and attacks its neighbors. Finally, it has close ties with countries throughout the Middle East, many of which have come to expect U.S. assistance if their security is in jeopardy.

At the heart of these commitments is the concept of extended deterrence: the explicit or implicit threat to retaliate against antagonists that attack U.S. allies, even if those antagonists do not strike the United States itself.[3]

Extended deterrence can help the United States uphold the status quo in several ways. Specifically, it can discourage revisionist powers from provoking crises or launching wars because there is a high probability that Washington will intervene to deny their aims and punish them for acts of aggression; it can dissuade friendly nations from developing controversial military capabilities that might heighten local tensions or trigger regional conflicts because those nations can rely on the United States instead; and it can offer a source of leverage over security partners, one that helps the United States to discourage other courses of action that might prove destabilizing and encourage positive steps on a variety of issues.

Despite its importance, extended deterrence is one of the most challenging aspects of American strategy. While persuading adversaries that the United States would retaliate for a direct attack is relatively easy, convincing them that it would retaliate for an attack against other nations is a much more difficult proposition. Furthermore, convincing allies that the United States will actually fight on their behalf—even if that means putting its own troops and territory at risk—can be even harder.[4] As Thomas Schelling famously wrote, when it comes to deterrence, "The difference between the national homeland and everything 'abroad' is the difference between threats that are inherently credible, even if unspoken, and the threats that have to be made credible."[5]

Not surprisingly, efforts to make extended deterrence credible in the eyes of adversaries and allies alike have shaped virtually every aspect of American military power. For instance, the United States has adhered to a conventional military strategy that emphasizes countering

3 In contrast to extended deterrence, direct deterrence refers to the threat of retaliation for an attack on a nation's own territory. Classic treatments of deterrence in both of its forms include Thomas C. Schelling, *Arms and Influence* (New Haven, CT: Yale University Press, 1967); Alexander L. George and Richard Smoke, *Deterrence in American Foreign Policy: Theory and Practice* (New York: Columbia University Press, 1974); and Paul K. Huth, *Extended Deterrence and the Prevention of War* (New Haven, CT: Yale University Press, 1988). For a more recent assessment of extended deterrence in particular, see Timothy Crawford, "The Endurance of Extended Deterrence: Continuity, Change, and Complexity in Theory and Policy," in T. V. Paul, Patrick J. Morgan, and James J. Wirtz, eds., *Complex Deterrence: Strategy in a Global Age* (Chicago: University of Chicago Press, 2009).

4 This observation is captured by the so-called "Healey Theorem": former British minister of defence Denis Healey's claim that it "only takes a 5 percent credibility of American retaliation to deter an attack, but it takes a 95 percent credibility to reassure the allies." See Denis Healey, *The Time of My Life* (London: Norton, 1989), p. 243. Of course, some allies can never be adequately reassured. French president Charles de Gaulle, for one, refused to believe that the United States would actually use nuclear weapons on behalf of its European allies, which prompted his decision to withdraw from NATO's integrated military command and develop an independent nuclear deterrent. See Bruno Tertrais, *L'Arme Nucleaire* (Paris: Presses Universitaires de France, 2008) p. 44.

5 Schelling, *Arms and Influence*, p. 36.

threats when and where they emerge rather than depending on local nations to prevent aggression or roll back expansion; it has fielded combined-arms forces capable of resisting distant rivals, even those with quantitative advantages in men and materiel; and it has built a global network of military bases to deploy, operate, and sustain those forces overseas.[6] Finally, but equally important, it has relied on its nuclear arsenal for the purpose of extending deterrence to its allies and partners.[7]

Throughout the Cold War, strategic nuclear weapons provided Washington with the capacity to conduct a devastating reprisal against the Soviet Union if Moscow ever launched a nuclear strike against the U.S. homeland or the Red Army attempted to overrun Europe. At the same time, theater and battlefield nuclear weapons, many of which were permanently stationed on allied territory, could be used to blunt an offensive by numerically superior Warsaw Pact forces if NATO's conventional units were not up to the task.[8] These weapons were also used to "couple" the United States to its vulnerable frontline partners, who had doubts that Washington would truly employ its strategic nuclear forces on their behalf. By raising the prospect of early nuclear use against Soviet troops and territory, the presence of non-strategic weapons signaled a U.S. willingness to escalate in defense of its allies rather than withdrawal to North America in the face of a successful Soviet invasion.[9]

Over the past twenty-five years, however, many of the extended deterrence dilemmas that occupied U.S. policymakers in the past—especially the dilemmas associated with extended *nuclear* deterrence—ceased to be a major source of concern. With Russia in decline and China focused on sustaining its economic rise, treaty allies in Europe and Asia have been relatively safe from serious threats. Meanwhile, as the world's sole superpower, the United States has enjoyed enormous military advantages over potential rivals and has been able to rely on its conventional forces to discourage aggression. This favorable situation appears to be changing, though, putting extended nuclear deterrence back on the agenda.

6 See, for example, Stacie L. Pettyjohn, *U.S. Global Defense Posture, 1783–2011* (Santa Monica, CA: RAND Corporation, 2012), especially chapter 9; and Evan Braden Montgomery, "Contested Primacy in the Western Pacific: China's Rise and the Future of U.S. Power Projection," *International Security*, 38, No. 4, Spring 2014, especially pp. 126–129.

7 On U.S. nuclear weapons and strategy, and how both have changed over time, see Fred Kaplan, *The Wizards of Armageddon* (Stanford, CA: Stanford University Press, 1983); Scott D. Sagan, *Moving Targets: Nuclear Strategy and National Security* (Princeton, NJ: Princeton University Press, 1989); and Lawrence Freedman, *The Evolution of Nuclear Strategy*, 3rd ed. (New York: Palgrave Macmillan, 2003).

8 Battlefield and theater nuclear weapons are also referred to more generally (and somewhat controversially) as tactical or non-strategic nuclear weapons—terms that are used interchangeably throughout this report.

9 Although the requirements of deterring adversaries and assuring allies often go hand in hand, the persistent concerns about "decoupling" during the Cold War and U.S. efforts to assuage these fears illustrate how they can clash. Specifically, the military utility and political value of non-strategic nuclear weapons were somewhat at odds in important ways. On the one hand, their contribution to deterrence was premised, at least in part, on the notion that nuclear war could be limited, particularly as the United States shifted from a doctrine of massive retaliation to one of flexible response. That is, the use of theater and battlefield weapons could compensate for NATO's conventional military disadvantages and allow it to stop a Warsaw Pact invasion without necessarily triggering a strategic nuclear exchange. On the other hand, however, their contribution to assurance was based on the idea that nuclear war might not be controllable. In other words, employment of battlefield and theater nuclear weapons might lead to strategic attacks against U.S. territory, which was precisely why European allies believed that the United States would ultimately "trade New York for Bonn," in the language of the times.

For example, although the unipolar moment appeared to herald the waning of geopolitics and the end of major power security competitions, at least according to some observers, revisionist actors are once again challenging the status quo in multiple regions.[10] Russia's invasion of Georgia, annexation of Crimea, and support for rebel groups in eastern Ukraine all indicate that Moscow does not respect the political order of post-Cold War Europe. At the same time, China's conventional military buildup has shifted the balance of power in Asia, while its "creeping expansion" in the South China Sea could enable Beijing to assert greater control over one of the world's most vital waterways. And despite the recent agreement to constrain its nuclear program, Iran continues to build offensive missile forces and support violent extremist groups. In short, Russia's piecemeal efforts to restore its lost continental empire, China's military expansion in its near seas and beyond, and Iran's willingness to both create and fill power vacuums throughout its neighborhood all suggest that "geopolitical rivalries have stormed back to center stage."[11]

Compounding this trend, the world is now in the midst of what many analysts refer to as a "second nuclear age," one that is arguably more complex and potentially more volatile than the bipolar U.S.–Soviet struggle that characterized the Cold War.[12] Not only does the United States still need to worry about maintaining strategic stability with a nuclear peer, albeit one possessing far fewer weapons than it did in the past, but it must also manage a number of other existing and emerging challenges: the proliferation of nuclear weapons and delivery systems to fragile nations, the expansion of nuclear arsenals by minor powers and aspiring major powers, and the pursuit of capabilities that are lowering the barriers to nuclear use and eroding the "firebreak" between conventional and nuclear conflict.[13]

What does all of this mean for the United States? Looking ahead, there is little reason to doubt that extended nuclear deterrence will remain a key feature of U.S. grand strategy and a major factor when it comes to military planning and procurement decisions. According to the Pentagon's most recent Quadrennial Defense Review (QDR), "Our nuclear deterrent is the ultimate protection against a nuclear attack on the United States, and through extended deterrence, it also serves to reassure our distant allies of their security against regional

10 See, for example, Steven Van Evera, "A Farewell to Geopolitics," in Melvyn P. Leffler and Jeffrey W. Legro, eds., *To Lead the World: American Strategy after the Bush Doctrine* (New York: Oxford University Press, 2008).

11 Walter Russell Mead, "The Return of Geopolitics: The Revenge of Revisionist Powers," *Foreign Affairs*, 93, No. 3, May/June 2014, p. 69. Notably, great power security competition is once again a major factor on the minds of senior U.S. defense officials. See, for instance, Secretary of Defense Ash Carter, "Remarks Previewing the FY 2017 Defense Budget," February 2, 2016, available at http://www.defense.gov/News/Speeches/Speech-View/Article/648466/remarks-previewing-the-fy-2017-defense-budget.

12 Colin S. Gray, *The Second Nuclear Age* (Boulder, CO: Lynne Reinner, 1999); Andrew F. Krepinevich, *Meeting the Challenge of a Proliferated World* (Washington, DC: Center for Strategic and Budgetary Assessments, 2010); Paul Bracken, *The Second Nuclear Age: Strategy, Danger, and the New Power Politics* (New York: Times Books, 2012); and Gregory D. Koblentz, *Strategic Stability in the Second Nuclear Age* (Washington, DC: Council on Foreign Relations, 2014).

13 On the erosion of firebreaks and the potential blurring between conventional and nuclear operations, see Barry D. Watts, *Nuclear-Conventional Firebreaks and the Nuclear Taboo* (Washington, DC: Center for Strategic and Budgetary Assessments, 2013).

aggression."[14] Moreover, the latest National Security Strategy declared that the United States "will protect our investment in foundational capabilities like the nuclear deterrent," and current modernization programs are making good on that promise, even in a period of relative resource scarcity.[15]

Yet the developments outlined above raise a number of questions:

- Is the current U.S. approach to extended nuclear deterrence likely to remain adequate?
- Does the United States have the right tools in place to prevent competitors from challenging the status quo and convince allies that they can rely on Washington?
- If not, how might the United States adapt its extended nuclear deterrence posture to preserve stability across the regions that concern it most?

This report addresses each of these issues. The next chapter provides an overview of U.S. extended nuclear deterrence commitments and presents an analytic framework for differentiating these commitments across regions. The following chapter describes the existing and emerging challenges to extended nuclear deterrence that are likely to concern U.S. policymakers most. The final chapter sketches out what updated extended nuclear deterrence postures might look like in Europe, East Asia, and the Middle East given this set of challenges.

14 *Quadrennial Defense Review 2014* (Washington, DC: Department of Defense, 2014), p. 13. The independent, bipartisan National Defense Panel tasked with reviewing the QDR similarly recommended, "Any future nuclear deterrent posture should continue to provide credible, effective deterrence and reassurance, including in the context of extended deterrence." See William J. Perry and John P. Abizaid, Co-Chairs, *Ensuring a Strong U.S. Defense for the Future: The National Defense Panel Review of the 2014 Quadrennial Defense Review* (Washington, DC: United States Institute of Peace, 2014), p. 55.

15 *National Security Strategy* (Washington, DC: The White House, February 2015), p. 8.

CHAPTER 2

The Different Forms of Extended Nuclear Deterrence

Making extended nuclear deterrence commitments credible has always been a difficult task. No matter how central these security guarantees are to grand strategy and defense planning, other nations can never be completely certain that the United States would actually launch a nuclear strike in retaliation for an attack on its allies. Setting aside the most extreme contingencies, many American policymakers might not know in advance what redlines an adversary would have to cross to truly warrant a nuclear reprisal rather than a conventional military response.

To a significant degree, however, assessments of Washington's credibility—and therefore the effectiveness of its threats and promises—are likely to be a function of its extended nuclear deterrence *posture*.[16] In fact, as the remainder of this chapter illustrates, the United States actually has three distinct extended nuclear deterrence postures: one for Europe, one for the Asia-Pacific, and one for the Middle East.[17]

16 Although the sources of credibility overlap to some extent when it comes to "general" (or peacetime) extended deterrence threats and "immediate" (or crisis) extended deterrence threats, they differ in important respects. For instance, the effectiveness of general extended deterrence will be determined by factors such as the number and types of weapons in the U.S. nuclear arsenal as well as the command and control arrangements governing who possesses these weapons in peacetime and who would use them in the event of a conflict. By contrast, the credibility of immediate extended deterrence will be determined more by specific steps that policymakers take when tensions are high, such as making public statements that put their personal reputations on the line, raising the alert level of nuclear forces to increase their readiness, and engaging in military exercises or more aggressive deployment patterns to demonstrate resolve. On the distinction between general and immediate deterrence, see Patrick M. Morgan, *Deterrence: A Conceptual Analysis* (Beverly Hills, CA: Sage Publications, 1977).

17 In a similar vein, analysts sometimes refer to different *models* of extended deterrence and compare the "Europe model" to the "Asia model." See, for example, Karl-Heinz Kamp, *NATO's Nuclear Posture Review: Nuclear Sharing Instead of Nuclear Stationing*, Research Paper No. 68 (Rome: NATO Defense College, May 2011); Brad Roberts, *Extended Deterrence and Strategic Stability in Northeast Asia*, Visiting Scholar Paper Series No. 1 (Tokyo: National Institute of Defense Studies, August 2013); and Jeffrey A. Larsen, "US Extended Deterrence and Europe: Time to Consider Alternative Structures?" in Stéfanie Von Hlatky and Andreas Wenger, eds., *The Future of Extended Deterrence: The United States, NATO, and Beyond* (Washington, DC: Georgetown University Press, 2015).

These postures vary along two main dimensions. The first is their *level of institutionalization*: whether they are based on formal defense pacts and, if so, whether those pacts include mechanisms for consultation and collaboration when it comes to the employment of nuclear weapons. The second is their *associated force structure*: whether there are non-strategic nuclear weapons reserved for use in regional contingencies or whether the United States would need to employ its strategic nuclear weapons to make good on an extended deterrent threat. Understanding the differences between these postures, how they have evolved over time, and how they continue to change can help to put emerging challenges in context and provide a baseline for developing potential options to mitigate those challenges.

The Structure of U.S. Security Commitments

Alliances—both formal and informal—have long been a source of competitive advantage for the United States. Allies can prevent hostile nations from extending their influence into geostrategically important areas, send their armed forces to support the United States in overseas contingencies, provide access to facilities that allow Washington to project power over vast distances, defray the costs of the U.S. global military presence, acquire useful intelligence that it might not be able to obtain on its own, and enhance the legitimacy of U.S. foreign policy by supporting its stance on key issues.[18] Of course, alliances also have downsides. For instance, allies can free ride on the United States by decreasing their own contributions to the common defense, assuming that Washington will make up for any capability gaps or capacity deficits. They can also entrap the United States in unwanted conflicts if security guarantees embolden them to engage in provocative behavior toward their rivals. Finally, they can impose significant opportunity costs on U.S. policymakers, who often devote considerable time and effort to assuring allies that they will not be left in the lurch, even when the prospect of abandonment is extremely small.[19]

On the whole, however, policymakers have generally viewed alliances as a net plus. Thus they have gone to great lengths to preserve and even expand the alliance portfolio that, for the most part, was assembled during the Cold War. Yet not all U.S. alliances are alike. Rather, they are structured in very different ways, which has important implications for extended nuclear deterrence.

In Europe, for example, the United States is committed to the protection of partner nations through its membership (and leading role) in NATO: a multilateral alliance with an integrated military command structure that was created more than sixty years ago to enhance collective defense against a hostile Soviet Union. According to Article V of the 1949 Washington Treaty

18 For an overview of U.S. alliances and security partnerships, including both their benefits and drawbacks, see Evan Braden Montgomery, *Reshaping America's Alliances for the Long Haul* (Washington, DC: Center for Strategic and Budgetary Assessments, 2009).

19 For classic treatments of these dynamics, see Mancur Olson and Richard Zeckhauser, "An Economic Theory of Alliances," *The Review of Economics and Statistics*, 48, No. 3, August 1966; and Glenn H. Snyder, *Alliance Politics* (Ithaca, NY: Cornell University Press, 1997).

that created NATO, "The parties agree that an armed attack against one or more of them in Europe or North America shall be considered an attack against them all," which would require member states to provide each other with assistance.[20] This has always included the potential use of U.S. nuclear weapons, particularly when Warsaw Pact conventional forces seemed to enjoy significant advantages over their NATO counterparts.

To bolster this extended nuclear deterrent, NATO developed two important mechanisms. First, the Nuclear Planning Group (NPG), along with its subordinate groups, allows all interested alliance members to engage in high-level discussions on nuclear issues and therefore gives those members a voice in policies relating to the possible use of nuclear weapons. Second, "dual-key" nuclear sharing arrangements allow select alliance members to not only host U.S. nuclear weapons on their territory, but also deliver some of those weapons themselves if the United States determines that crossing the nuclear threshold is necessary.[21] Together, these mechanisms have dissuaded many (though not all) allies from pursuing their own nuclear weapons by giving them a better alternative; assured local nations that the United States would fight on their behalf by providing them with more influence over escalation dynamics; and deterred conflict by putting nuclear weapons directly into the hands of those nations that would be the immediate targets of aggression.

Although the end of the Cold War seemingly removed the main rationale for NATO's status as a "nuclear alliance," and although public and political sentiment in some member states has been in favor of scaling back or even abandoning that status, the United States continues to extend its nuclear umbrella over much of Europe. Moreover, both the NPG and nuclear sharing arrangements remain in place. As NATO's 2010 Strategic Concept declared, "Deterrence, based on an appropriate mix of nuclear and conventional capabilities, remains a core element of our overall strategy."[22]

By contrast, U.S. alliances in the Asia-Pacific differ in three important respects. First, rather than forming a single, multilateral alliance to contain Soviet and Chinese expansion during the Cold War, Washington generally opted for bilateral defense pacts with its local partners—an

20 North Atlantic Treaty, April 4, 1949, available at http://www.nato.int/cps/en/natolive/official_texts_17120.htm.

21 Currently, every NATO member with the exception of France participates in the NPG. By contrast, only a handful of NATO members are part of the alliance's nuclear sharing arrangements, although a number of additional members contribute to this mission via their involvement in SNOWCAT (Support of Nuclear Operations With Conventional Air Tactics), which includes escort duty, suppression of enemy air defenses, aerial refueling, and search and rescue operations. See Kamp, *NATO's Nuclear Posture Review*; and Hans M. Kristensen, *Non-Strategic Nuclear Weapons*, Special Report No. 3 (Washington, DC: Federation of American Scientists, May 2012).

22 NATO, *Active Engagement, Modern Defence: Strategic Concept for the Defence and Security of the Members of the North Atlantic Treaty Organization* (Brussels: NATO Graphics and Printing, November 19–20, 2010), p. 14, available at http://www.nato.int/strategic-concept/pdf/Strat_Concept_web_en.pdf. Another assessment of NATO's nuclear posture conducted two years later reached the same conclusion: "As long as nuclear weapons exist, NATO will remain a nuclear alliance." NATO, "Deterrence and Defence Posture Review," press release, May 20, 2012, available at http://www.nato.int/cps/en/natolive/official_texts_87597.htm.

approach that stemmed in large part from lingering fears of entrapment during the 1950s.[23] Second, excluding the Republic of Korea (ROK) where the United States has been responsible for wartime operational control over host nation forces, none of these pacts resulted in the development of integrated military command structures.[24] Third, although Washington previously stationed nuclear weapons on the territory of some allies in the region, these weapons remained in the sole custody of U.S. forces, and no nuclear planning organizations or nuclear sharing arrangements analogous to those found in NATO were ever created.[25]

As in Europe, the United States continues to extend its nuclear deterrent to several nations in the Asia-Pacific, namely Japan, South Korea, and Australia.[26] For instance, the most recent "2+2" meeting between Washington and Tokyo emphasized "the ironclad U.S. commitment to the defense of Japan, through the full range of U.S. military capabilities, including nuclear and conventional."[27] Similarly, the joint communiqué produced by the latest United States and South Korea Security Consultative Meeting "reaffirmed the continued U.S. commitment to provide and strengthen extended deterrence for the ROK using the full range of military capabilities, including the U.S. nuclear umbrella, conventional strike and missile defense capabilities."[28] And although the United States has not made similar public declarations with regard to Australia, it is clear that Canberra also relies on American nuclear security

23 Victor Cha, "Powerplay: Origins of the U.S. Alliance System in Asia," *International Security*, 34, No. 3, Winter 2009/10. Not all alliances in the Asia-Pacific region were bilateral. For instance, the alliance between Australia and the United States was originally part of the trilateral Australia, New Zealand, and United States (ANZUS) alliance, but New Zealand effectively withdrew from the organization in the mid-1980s over its stance against U.S. nuclear-armed and nuclear-powered ships entering its ports. In addition, while the United States established a much broader multilateral alliance in the region during the 1950s, the Southeast Asia Treaty Organization (SEATO) was never as militarily integrated or as politically cohesive as NATO and was dissolved barely two decades after its creation.

24 For an overview of the organizational aspects of U.S. military alliances in Asia, see Jeffrey Hornung, *Modeling a Stronger U.S.–Japan Alliance: Assessing U.S. Alliance Structures* (Washington, DC: Center for Strategic and International Studies, November 2015). Although the United States plans to transfer wartime operational control over host nation forces to the South Korean government, that transfer has been repeatedly postponed.

25 The United States previously deployed nuclear weapons in the Philippines, South Korea, and Taiwan, as well as Okinawa before its reversion to Japan in 1972. See Matthew Fuhrman and Todd S. Sechser, "Nuclear Strategy, Nonproliferation, and Foreign Nuclear Deployments," *Journal of Conflict Resolution*, 58, No. 3, 2014.

26 Steven Pifer et al., *U.S. Extended Nuclear Deterrence: Considerations and Challenges*, Brookings Arms Control Series Paper 3 (Washington, DC: Brookings Institution, May 2010), p. 1. On the continuing—and arguably growing—importance of extended nuclear deterrence in the region, see Andrew O'Neil, "Extended Nuclear Deterrence in East Asia: Redundant or Resurgent?" *International Affairs*, 87, No. 6, 2011.

27 Joint Statement of the Security Consultative Committee, "A Stronger Alliance for a Dynamic Security Environment: The New Guidelines for U.S.–Japan Defense Cooperation," April 27, 2015, available at http://www.state.gov/r/pa/prs/ps/2015/04/241125.htm.

28 "Full Text of the 47th ROK–U.S. Joint Communiqué," United States Forces Korea (USFK), November 1, 2015, available at http://www.usfk.mil/Media/News/tabid/12660/Article/626859/full-text-of-47th-rok-us-joint-communique.aspx.

guarantees, particularly given the role that it plays in supporting U.S. strategic nuclear forces by hosting joint early-warning and communications facilities.[29]

Like both of these regions, the Middle East is also home to a number of security partners: nations that purchase U.S. arms, host U.S. facilities, train with U.S. troops, and sometimes fight alongside them as well. Washington does not have defense pacts with any of these countries, however, electing instead to cooperate more informally, although it has publically reaffirmed its commitment to protect its partners on many occasions. Not surprisingly, some of these relationships are as close as any treaty-based alliance.

The United States has long viewed the Middle East as a critical region and has played a key role in preserving stability there. Specifically, its strategy toward the area since the 1970s has rested on three enduring pillars: preserving the security of Israel, maintaining close ties with friendly Arab nations, and ensuring the free flow of resources through the Persian Gulf. Consequently, Washington has provided Israel with considerable diplomatic, financial, and material assistance, to include shielding it from pressure in international organizations, supplying it with advanced weapons, supporting its development of new military capabilities, and restocking its armed forces when they have run short of supplies during past conflicts. The United States has also sustained a significant military presence in the region, with key facilities in Kuwait, Qatar, Bahrain, and the United Arab Emirates.[30] Perhaps most important of all, it has come to the defense of local nations under duress, especially during the late 1980s, when Iran was menacing oil exports from the region, and throughout the 1990s, when Iraq was a constant threat to its neighbors.

Given that these security commitments are informal, they do not have an obvious nuclear component. However, the United States has previously engaged in nuclear brinkmanship when a local partner was in danger—notably in 1973, when the Nixon administration raised the alert level of U.S. nuclear forces to deter Soviet intervention in the Yom Kippur War.[31] Furthermore, ties between the United States and some of its allies in the region are so strong

29 According to Canberra, "Australia is confident in the continuing viability of extended nuclear deterrence under the Alliance, while strongly supporting ongoing efforts towards global nuclear disarmament." Department of Defence, *Defence White Paper 2013* (Canberra: Australian Government, 2013), p. 29, available at http://www.defence.gov.au/whitepaper/2013/docs/WP_2013_web.pdf. On the joint surveillance and communications facilities located in Australia, see Minister of Defence Stephen Smith, "Ministerial Statement on Full Knowledge and Concurrence," June 26, 2013, available at http://www.minister.defence.gov.au/2013/06/26/minister-for-defence-stephen-smith-ministerial-statement-on-full-knowledge-and-concurrence/.

30 On the U.S. military presence in the region, see *The Gulf Security Architecture: Partnership with the Gulf Cooperation Council*, a Majority Staff Report Prepared for the Use of the Committee On Foreign Relations, United States Senate, One Hundred Twelfth Congress, Second Session, June 19, 2012 (Washington, DC: Government Printing Office, 2012).

31 See, for example, Barry M. Blechman and Douglas M. Hart, "The Political Utility of Nuclear Weapons: The 1973 Middle East Crisis," *International Security*, 7, No. 1, Summer 1982, 132–156; Janice Gross Stein, "Extended Deterrence in the Middle East: American Strategy Reconsidered," *World Politics*, 39, No. 3, April 1987; Janice Gross Stein, "Deterrence and Compellence in the Gulf, 1990–91: A Failed or Impossible Task?" *International Security*, 17, No. 2, Fall 1992; and Kathleen J. McInnis, "Extended Deterrence: The U.S. Credibility Gap in the Middle East," *The Washington Quarterly*, 28, No. 3, Summer 2005.

that it is impossible to rule out the notion of Washington resorting to nuclear threats under certain conditions.

The Size and Shape of the U.S. Nuclear Arsenal

During the Cold War, the United States had a massive, diverse, and globally distributed nuclear arsenal, which it relied upon to deter attacks against itself and its allies. Today, it has a much smaller, less varied, and more geographically concentrated arsenal, which continues to underpin its security commitments and backstop its conventional military power.

Few would argue that the United States needs as many nuclear weapons as it once had or as many different types of weapons as it once produced. Indeed, if there is one consistent trend in U.S. defense policy over the past twenty-five years, it is the gradual marginalization of nuclear weapons as a central tool of American military power. According to the 2010 Nuclear Posture Review, "The United States has reduced our reliance on nuclear weapons as Cold War nuclear rivalries have eased and as our conventional military forces and missile defense capabilities have strengthened," although it also maintained that U.S. nuclear weapons "will continue to play an essential role in deterring potential adversaries, reassuring allies and partners around the world, and promoting stability globally and in key regions."[32] Nevertheless, changes in the size and shape of the arsenal have important implications for how Washington extends nuclear deterrence to other nations—and those changes could have significant consequences if dormant rivalries reemerge, new rivalries become more intense, and the conventional military advantages that the United States has counted on begin to erode.

To provide some context, the size of the U.S. nuclear arsenal has been steadily declining for nearly five decades after reaching an apex of more than 32,000 warheads in 1967. According to publicly available information, the United States currently has an estimated inventory of 4,760 nuclear warheads: 2,080 deployed warheads (including both strategic and non-strategic warheads) and 2,680 non-deployed warheads (which are kept in reserve as a hedge against technical problems or adverse changes in the security environment that might necessitate replacing existing weapons or fielding more of them).[33]

The backbone of this arsenal continues to be the triad of strategic delivery systems: heavy bombers, land-based intercontinental ballistic missiles (ICBMs), and nuclear-powered ballistic missile submarines (SSBNs). Although each leg has been scaled back repeatedly over the years, the triad has remained intact. It has likewise survived periodic calls for the United States to adopt a dyad or monad instead. Moreover, Washington's current plans call for overhauling its aging strategic weapons, along with upgrading command and control systems,

32 *Nuclear Posture Review Report* (Washington, DC: Department of Defense, 2014), pp. 5–6.

33 Hans M. Kristensen and Robert S. Norris, "US Nuclear Forces, 2015," *Bulletin of the Atomic Scientists*, 71, No. 2, 2015, p. 107. Another 2,340 nuclear warheads are retired, intact, and scheduled to be dismantled.

extending the life of existing warheads, and revitalizing the physical infrastructure that is needed to monitor and maintain the nuclear arsenal.

For example, the penetrating component of the bomber leg, which currently includes a handful of stealthy B-2 aircraft, will eventually be comprised of the new B-21. Meanwhile, the standoff component of the bomber leg, which is made up of B-52H aircraft armed with air-launched cruise missiles (ALCMs), is scheduled to receive the Long-Range Standoff (LRSO) missile before the ALCM is withdrawn from service. The United States also maintains nearly 450 Minuteman III ICBMs, which were initially fielded in 1970 and will eventually be replaced by the Ground-Based Strategic Deterrent (GBSD). Lastly, as the current Ohio-class SSBNs start to retire in just over a decade, the new and more advanced Ohio-Replacement will begin to enter the fleet.[34]

Whereas the strategic nuclear arsenal is essentially a similar but smaller version of what it once was, the non-strategic nuclear arsenal has nearly been eliminated over the past several decades. During the Cold War, Washington developed and fielded a wide array of non-strategic nuclear weapons: gravity bombs, depth bombs, artillery rounds, torpedoes, surface-to-air missiles, cruise missiles that could be launched from a variety of platforms, and both short-range and intermediate-range ballistic missiles. Many of these weapons were also kept outside the United States. The number of forward deployed U.S. nuclear weapons in Europe peaked during the early 1970s at more than 7,000 warheads, many of them located in Germany, while the number of weapons in Asia peaked during the late 1960s at more than 3,000 warheads, most of which were located in Okinawa and South Korea. In addition, aircraft carriers, surface combatants, and attack submarines all carried or were capable of being equipped with non-strategic nuclear warheads.[35]

Although the number of forward deployed nuclear warheads shrank throughout 1970s and 1980s, the decline and eventual collapse of the Soviet Union called into question the rationale for maintaining such a large stockpile of battlefield and theater weapons, as well as the chief arguments for keeping them overseas. This downward trend accelerated in 1987 with the signing of the Intermediate-Range Nuclear Forces (INF) Treaty, which obligated the United States to destroy its Pershing II intermediate-range ballistic missiles (IRBMs) and Gryphon ground-launched cruise missiles (GLCMs)—systems that posed such a serious threat to the Soviet Union that Moscow was eventually willing to sacrifice a much larger number of its own

34 These plans are somewhat controversial, however, given the Obama administration's stated desire to move toward a nuclear weapons-free world, as well as the fiscal pressures that have put defense spending under serious strain. For an overview of these modernization efforts and their expected costs, see Evan Braden Montgomery, *The Future of America's Strategic Nuclear Deterrent* (Washington, DC: Center for Strategic and Budgetary Assessments, 2013); and Todd Harrison and Evan Braden Montgomery, *The Cost of U.S. Nuclear Forces: From BCA to Bow Wave and Beyond* (Washington, DC: Center for Strategic and Budgetary Assessments, 2015).

35 Robert S. Norris and William M. Arkin, "Where They Were," *Bulletin of the Atomic Scientists,* 55, No. 6, 1999.

IRBMs to reach a deal.[36] Then, in 1991, the United States announced the first in a series of unilateral changes to its nuclear posture. Specifically, President George H. W. Bush declared that the United States would withdraw and destroy the remainder of its forward-deployed nuclear artillery and tactical ballistic missiles from Europe as well as from Asia—a decision that, in concert with the INF Treaty, effectively de-nuclearized U.S. ground forces. Washington would also remove nuclear weapons from its surface combatants, attack submarines, and land-based naval aircraft.

Several years later, during the 1994 Nuclear Posture Review, the Clinton administration determined that aircraft carriers and surface ships would no longer need the ability to carry nuclear weapons at all, which left the Navy with only the nuclear variant of the Tomahawk Land-Attack Missile (TLAM-N)—a weapon that was still considered a key component of U.S. extended nuclear deterrence commitments in the Asia-Pacific region, even though it was kept in storage and would have to be loaded onto submarines if needed during a crisis. Moreover, the Obama administration eventually decided to retire TLAM-N during the 2010 Nuclear Posture Review. Finally, throughout the 1990s and 2000s, the United States repeatedly affirmed its commitment to maintain nuclear gravity bombs and dual-capable combat aircraft in Europe, but continued to reduce and consolidate these forces at the same time.[37]

At present, the United States has approximately 500 non-strategic weapons remaining in its nuclear arsenal, all of which are variants of the B61 gravity bomb (the B61-3, B61-4, and B61-10). According to open sources, a smaller subset of those weapons still remain forward deployed in Europe, where they can be mated with dual-capable U.S. (F-15E and F-16) and host nation (F-16 and Tornado) strike aircraft.[38] Although these weapons are approaching the end of their lifespan, the United States is in the midst of a modernization program that will consolidate four variants of the B61 (the non-strategic B61-3/4/10s and strategic B61-7s) into a single model, which can be carried by short-range fighters and long-range bombers alike—including dual-capable versions of the F-35A once they are fielded sometime in the 2020s.[39] The new B61-12 will be more accurate than the models it is replacing, enabling it to hold strategic targets at risk with the smaller yield produced by the tactical variants that the updated

36 On Soviet fears of U.S. intermediate-range missile deployments, see Evan Braden Montgomery, "Breaking Out of the Security Dilemma," *International Security*, 31, No. 2, Fall 2006, pp. 178–183; and Dmitry Adamsky, "The 1983 Nuclear Crisis: Lessons for Deterrence Theory and Practice," *Journal of Strategic Studies*, 36, No. 1, 2013.

37 See Kristensen, *Non-Strategic Nuclear Weapons*; and Amy F. Woolf, *Nonstrategic Nuclear Weapons* (Washington, DC: Congressional Research Service, February 23, 2015). On the Presidential Nuclear Initiatives, see Susan J. Koch, *The Presidential Nuclear Initiatives of 1991–1992* (Washington, DC: National Defense University Center for the Study of Weapons of Mass Destruction, September 2012).

38 Kristensen and Norris, "US Nuclear Forces, 2015."

39 James Drew, "Pentagon Firming F-35 Block 4 Configuration," *Flight Global*, May 26, 2015.

weapon is based on. Nevertheless, this program will also result in an overall decline in the size of the arsenal.[40]

Alternative Extended Nuclear Deterrence Postures

The underlying structure of U.S. alliances and the changing composition of the U.S. nuclear arsenal each has important implications for extended nuclear deterrence. Specifically, the greater the degree of institutionalization in an alliance relationship and the more capabilities that are dedicated to the defense of specific allies, the more effective U.S. security guarantees should be at discouraging hostile nations from engaging in coercion and dissuading friendly nations from pursuing dangerous courses of action—including the development or acquisition of their own nuclear weapons.

For instance, formal commitments often put U.S. credibility on the line and raise the costs of failing to assist partners in need, whereas informal commitments can leave significant uncertainly about whether and when Washington would retaliate for attacks on its allies. Integrated military commands can make peacetime coordination easier, enhance responsiveness during a crisis, and increase the effectiveness of combined operations, whereas separate commands can create a number of difficulties as partners negotiate over their division of labor along with the roles and missions that their respective forces should adopt. Perhaps most important for extended nuclear deterrence, standing organizations that provide a window into U.S. operational plans for nuclear use, as well as arrangements that directly incorporate other nations into those plans, can demonstrate a clear willingness to escalate if necessary—and can bind allies together in the face of grave threats that might otherwise divide them.

At the same time, non-strategic nuclear weapons that are forward deployed or rapidly forward deployable can bolster extended deterrence. In particular, they can address some of the limitations of strategic nuclear forces, including the difficulty of withholding inherently global assets for use on behalf of certain allies in specific regions; the risk that a limited nuclear response could be mistaken as the start of a massive nuclear strike; and the inability to respond both promptly *and* proportionately in a variety of scenarios given the large explosive yield of most strategic nuclear weapons.[41]

40 Hans M. Kristensen, "The B61 Life-Extension Program: Increasing NATO Nuclear Capability and Precision Low-Yield Strikes," *Federation of American Scientists Issue Brief*, June 2011; and Hans M. Kristensen and Robert S. Norris, "Worldwide Deployments of Nuclear Weapons, 2014," *Bulletin of the Atomic Scientists*, 70, No. 5, 2014. In addition to roughly 500 B61-3s/4s/10s, nearly 300 B61-7s (a strategic variant of the bomb) are part of the life-extension program, which is expected to produce fewer than 500 total weapons. Although that number is close to the current inventory of non-strategic B61s, the pool of B61-12s must be available for use by fighter-aircraft as well as long-range bombers. For these numbers, see Hans M. Kristensen and Robert S. Norris, "The B61 Family of Nuclear Bombs," *Bulletin of the Atomic Scientists,* 70, No. 3, 2014.

41 As Keir Lieber and Daryl Press have persuasively argued, high-yield strategic nuclear weapons might not be particularly useful for deterring limited nuclear strikes with relatively low-yield weapons because they would be disproportionate and potentially ineffective. See Keir A. Lieber and Daryl G. Press, "The Nukes We Need: Preserving the American Deterrent," *Foreign Affairs*, 88, No. 6, November/December 2009; and Keir A. Lieber and Daryl G. Press, "The New Era of Nuclear Weapons, Deterrence, and Conflict," *Strategic Studies Quarterly*, 7, No. 1, Spring 2013.

Taken together, these two factors illustrate how U.S. security commitments differ across regions:

- In Europe, the United States has a highly institutionalized extended nuclear deterrence posture, one that is characterized by a formal defense pact, integrated military command structures, collaborative nuclear planning, and the joint custody of U.S. nuclear weapons—which enables NATO members to share the roles, risks, and responsibilities of nuclear operations. Europe is also the one region overseas where the United States continues to maintain non-strategic nuclear weapons on a permanent basis, and therefore would not necessarily have to use its strategic forces to enforce its retaliatory threats in a nuclear use scenario.

- In the Asia-Pacific, the United States has a moderately institutionalized extended nuclear deterrence posture, with formal defense pacts that increase the odds of Washington defending its allies, but no real mechanisms beyond verbal guarantees to give those pacts a nuclear dimension. Moreover, with no forward deployed non-strategic nuclear weapons, no forward deployable naval nuclear weapons, and little prospect that the United States would send nuclear-armed fighter aircraft to the region in the midst of a crisis given the lack of infrastructure to support them (from hardened shelters that protect aircraft on the ground to specialized vaults that are used to store nuclear weapons themselves), Washington would be almost entirely dependent on strategic assets if nuclear use became necessary.[42]

- In the Middle East, the United States has a non-institutionalized extended nuclear deterrence posture. Rather, its posture is informal and ambiguous, although perhaps implicit in the case of some countries. That means that Washington must rely almost exclusively on signaling during a crisis (e.g., raising alert levels, mobilizing forces, and making public statements) if it wants to hold out the threat of nuclear reprisal and make it credible. For many of the same reasons that apply to the Asia-Pacific, this posture is largely dependent on strategic nuclear forces.

Moreover, the trend lines in each region are clear. First, the structure of U.S. alliances have not changed much and appear unlikely to change in the near future, notwithstanding modest movements toward greater institutionalization in East Asia with the establishment of a U.S.–Japan Extended Deterrence Dialogue, a U.S.–ROK Extended Deterrence Policy Committee and, more recently, a U.S.–ROK Deterrence Strategic Committee. Second, with the withdrawal of most forward deployed nuclear weapons and an end to sea-basing non-strategic weapons, the United States has become more and more dependent on its strategic triad to uphold extended deterrence commitments. Even in Europe, the number of forward deployed weapons

42 In the future, Washington could deploy strategic aircraft capable of delivering non-strategic nuclear weapons (namely B-2 or B-21 bombers armed with variable-yield B61-12 gravity bombs) to a location such as Guam. Yet the potential vulnerability of these assets as well as the importance of long-range penetrating bombers as conventional strike platforms suggest that this alternative might not be pursued in many scenarios.

is so small, the readiness level of aircraft tasked with the delivery of those weapons is so low, and the survivability of legacy dual-capable aircraft in the face of advanced Russian air defense systems is so questionable that the United States might still look to its strategic nuclear forces if deterrence failed and nuclear use were on the table—with all of the aforementioned risks this would entail.[43]

Why do these postures and the differences between them matter? The simple answer is that the United States is facing new challenges to extended nuclear deterrence. As it determines how to respond to those challenges, it might need to reconsider both the structure of its alliances and the capabilities it can bring to bear in defense of its commitments.

43 Whereas U.S. and allied forces were once prepared to conduct nuclear strike operations on short notice in the event of a conflict with the Warsaw Pact, it would now take weeks and perhaps months to generate that capability. See George Perkovich et al., *Looking Beyond the Chicago Summit: Nuclear Weapons in Europe and the Future of NATO* (Washington, DC: Carnegie Endowment for International Peace, 2012), pp. 7, 9.

CHAPTER 3

The Emerging Challenges to Extended Nuclear Deterrence

To some extent, the United States has taken extended nuclear deterrence for granted since the decline and fall of the Soviet Union. This is hardly surprising given how rarely its security commitments have been tested over the past twenty-five years. That is not likely to remain the case for much longer, however.

In Europe, Russia appears determined to provoke, unnerve, and perhaps divide NATO by redrawing borders across its near-abroad, strengthening its military after a long period of neglect, and engaging in nuclear saber rattling that is dangerously reminiscent of an earlier era. In the Asia-Pacific, North Korea is improving its nuclear and missile forces, which are a persistent and growing threat to its neighbors, as well as to the United States. Meanwhile, China is becoming a major power and taking steps to shift the local conventional military balance in its favor. Finally, in the Middle East, multilateral diplomacy has eased fears that Iran might acquire nuclear weapons in the near future. But it has not erased suspicions about its long-term nuclear ambitions or addressed its efforts at subversion and support of proxies throughout the region. Moreover, it has arguably heightened concerns about the possibility of U.S. retrenchment, at least on the part of some American allies in the region.

All of these developments could pose serious challenges for the United States and its extended nuclear deterrence commitments. Importantly, though, *the specific types of challenges* that it must be prepared to address will differ in each of these regions.

For instance, given Moscow's emphasis on nuclear weapons as instruments of coercion and warfighting, Washington needs to seriously consider how it can prevent limited nuclear use on the part of Russia. When it comes to extended nuclear deterrence, therefore, its chief concern in Europe is likely to be escalation management. By contrast, the increasing vulnerability of allies such as Japan and South Korea, both of which are wealthy and technologically advanced nations, means that the United States might eventually confront partners in the

Asia-Pacific that are seriously considering whether to acquire nuclear weapons of their own. In other words, the main challenge in this region is likely to be non-proliferation. Finally, doubts about U.S. reliability could drive countries in the Middle East to seek out other nuclear-armed patrons, which would undermine the U.S. near monopoly on extended nuclear deterrence and introduce new risks into the area.[44] Therefore, its chief concerns will be preserving that monopoly and avoiding the dangers that might arise if other external actors extend their own nuclear umbrellas.[45]

Escalation Dynamics in Europe

Although NATO remains a nuclear alliance and appears determined to maintain that status, it has been progressively reducing its dependence on nuclear weapons for decades. In addition to the significant changes in force size and force structure summarized in the previous chapter, NATO has declared that its nuclear weapons are no longer targeted at any particular country; that it is committed to helping create a nuclear weapons-free world; and that it will pursue opportunities to reduce the number of U.S. nuclear weapons based in Europe even further.[46] Put another way, these weapons are no longer considered necessary tools for meeting a specific, plausible, and potentially overwhelming threat. Instead, they are mainly valued for their contribution to alliance solidarity (particularly given concerns that the "denuclearization" of NATO might cause it to grow weaker or perhaps unravel) and their status as potential bargaining chips in any future arms control negotiations with Russia (even though the possibility of such negotiations seems vanishingly small at present).

Yet Moscow is moving in the opposite direction. This represents a sharp reversal from the Cold War-era, when NATO leaned heavily on its nuclear capabilities while the Soviet Union pledged that it would not be the first side to employ nuclear weapons. In recent years, however, it has been accused by the United States of violating the INF Treaty by testing a prohibited ground-launched cruise missile;[47] it has conducted large-scale military exercises involving the simulated use of nuclear weapons;[48] it has threatened to deploy nuclear-capable missiles

44 As Bruno Tertrais notes, both the United Kingdom and France are nuclear powers with security commitments in the Middle East, although the extent to which those commitments have a nuclear component is unclear. Bruno Tertrais, "The Future of Extended Deterrence: A Brainstorming Paper," in *Perspectives on Extended Deterrence* (Paris: Foundation Pour la Recherche Stratégique, 2010), p. 8.

45 These challenges are not mutually exclusive and could overlap in some cases. The argument in this chapter, however, is that the United States is likely to confront one overriding challenge to its extended nuclear deterrence commitments in each region, which should influence how it attempts to uphold its security guarantees.

46 In addition to the documents cited in footnote 22, see NATO, "The Alliance's Strategic Concept," press release, April 24, 1999, available at http://www.nato.int/cps/en/natolive/official_texts_27433.htm.

47 Amy F. Woolf, *Russian Compliance with the Intermediate Range Nuclear Forces (INF) Treaty: Background and Issues for Congress* (Washington, DC: Congressional Research Service, October 13, 2015).

48 See, for example, Roger McDermott, "Vostok 2014 and Russia's Hypothetical Enemies (Part One)," *Eurasia Daily Monitor*, 11, No. 167, September 23, 2014. This follows earlier exercises that also simulated nuclear use in a conflict against NATO.

to the enclave of Kaliningrad;[49] it has flown nuclear-capable bombers in close proximity to U.S., British, Norwegian, and Swedish airspace at a much higher rate than it once did;[50] and, according to President Vladimir Putin, it very nearly raised the alert level of its strategic nuclear forces during the crisis in Crimea to deter outside intervention by Western nations.[51]

These incidents seem to be part of a broader pattern. Russia has made nuclear weapons an increasingly important part of its defense policy toolkit—and has become increasingly dependent on them for deterrence, compellence, and warfighting.[52] Not only does it have far more non-strategic nuclear weapons than the United States, but it also has a far more diverse arsenal. Despite its own arms reductions in the aftermath of the Cold War, including unilateral measures that were implemented in response to the withdrawal of most U.S. tactical nuclear forces from Europe, Moscow retains approximately 2,000 operationally-available non-strategic nuclear warheads, which can be delivered by air defense, coastal defense, maritime strike, land attack, anti-surface warfare, and anti-submarine warfare weapons. Many of these forces are also being modernized.[53]

Perhaps even more important, Russia appears to be lowering the barriers to nuclear use. That is, Russian strategists have gravitated toward the idea that non-strategic nuclear weapons can actually deescalate a conflict.[54] According to this logic, breaking the nuclear taboo through demonstration shots or limited strikes would reveal a clear willingness to escalate a conflict and, in the end, convince adversaries to back down.[55]

49 "Russia May Put Missiles in Kaliningrad if U.S. Upgrades Nuclear Arms in Germany: Interfax," *Reuters*, September 23, 2015.

50 Michael Winter, "Russian Bombers Increase Flights Near U.S. Airspace," *USA Today*, August 7, 2014; Ben Farmer and Roland Oliphant, "Why are Russian Bombers Flying Close to Britain?" *Daily Telegraph*, September 13, 2015; Andrew Higgins, "Norway Reverts to Cold War Mode as Russian Air Patrols Spike," *New York Times*, April 1, 2015; and "Sweden Intercepts Russian Planes over Baltic Amid Regional Tensions," *Reuters*, March 24, 2015. For a detailed log of aviation incidents, see Thomas Frear, Lukasz Kulesa, and Ian Kearns, *Dangerous Brinkmanship: Close Military Encounters between Russia and the West in 2014* (London: European Leadership Network, November 2014); and Thomas Frear, Lukasz Kulesa, and Ian Kearns, "Russia—West Dangerous Brinkmanship Continues," European Leadership Network, March 12, 2015.

51 Neil MacFarquhar, "Putin Says He Weighed Nuclear Alert over Crimea," *New York Times*, March 15, 2015.

52 Stephen J. Blank, "Russia and Nuclear Weapons," in Stephen J. Blank, ed., *Russian Nuclear Weapons: Past, Present, and Future* (Carlisle, PA: U.S. Army War College Strategic Studies Institute, 2011), p. 293.

53 Hans M. Kristensen and Robert S. Norris, "Russian Nuclear Forces, 2015," *Bulletin of the Atomic Scientists*, 71, No. 3, 2015.

54 Jacob W. Kipp, "Russian Doctrine on Tactical Nuclear Weapons: Contexts, Prisms, and Connections," in Tom Nichols, Douglas Stuart, and Jeffrey D. McCausland, eds., *Tactical Nuclear Weapons and NATO* (Carlisle, PA: U.S. Army War College Strategic Studies Institute, 2012), p. 133. See also Roger McDermott, "Putin's Use of the 'Nuclear Card'," *Eurasia Daily Monitor*, 12, No. 122, June 30, 2015. The extent to which Moscow has actually developed the capabilities, operational concepts, and command and control arrangements needed to fully put this type of nuclear strategy into practice remains unclear, however. See Dmitry Adamsky, "Nuclear Incoherence: Deterrence Theory and Non-Strategic Nuclear Weapons in Russia," *Journal of Strategic Studies*, 37, No. 1, 2014.

55 The same logic appears to be influencing Pakistani nuclear strategy, which is not surprising given that Islamabad confronts a similar situation—namely, it too faces an opponent with conventional military advantages but few limited nuclear options. See Evan Braden Montgomery and Eric S. Edelman, "Rethinking Stability in South Asia: India, Pakistan, and the Competition for Escalation Dominance," *Journal of Strategic Studies*, 38, Nos. 1–2, 2015.

Moscow's heavy emphasis on nuclear weapons is a product of several factors. Just as its conventional forces were growing weaker during the 1990s and 2000s, the United States was actively promoting democracy in eastern Europe, spearheading the expansion of NATO, investing more resources in ballistic missile defense systems, and developing offensive precision-strike capabilities—measures that were not necessarily directed against Russia but that nevertheless played on its longstanding political and military insecurities, including fears of foreign subversion and American technological superiority. At the same time, China was enjoying substantial economic growth and embarking on a major military modernization program, enabling it to reverse the military balance with its neighbor to the north and fueling perceptions of Russian decline. Under these conditions, Russia's nuclear arsenal represented—and continues to represent—a useful tool for offsetting its own qualitative and quantitative disadvantages along two fronts.

These developments are troubling for a number of reasons and conjure up a variety of worrisome scenarios with direct implications for U.S. extended nuclear deterrence.

Russia's efforts to upend the prevailing order in Europe—and to regain its status as a major power that is feared because of its strength rather than its weakness—are already putting it on a collision course with NATO. In this context, nuclear coercion is one way that it could undermine alliance cohesion. For instance, if Russia were to seriously threaten frontline allies such as Poland or the Baltic nations, and if other NATO members were to stand aside or respond half-heartedly due to fears of escalation and the hope of avoiding a nuclear standoff, then Moscow might succeed in creating divisions within the alliance and gaining an advantage in a long-term competition with the West. Alternatively, if Russia were to miscalculate NATO's resolve and provoke a forceful reaction by threatening its members, then a situation might arise in which it was tempted to actually employ nuclear weapons, whether to gain the upper hand in a conflict or find a way out of a failing military campaign.[56]

One reason why these contingencies are such a concern is that NATO has few options for responding in kind—and therefore might find it extremely difficult to deter them in the first place. Given the low readiness, limited quantity, and questionable survivability of U.S. nuclear weapons and delivery systems based in Europe, not to mention the general aversion to nuclear weapons prevalent among many NATO members, the alliance has both capability and credibility gaps when it comes to situations such as those described above. That, in turn, provides opportunities for a risk-acceptant Russia to engage in nuclear brinkmanship and perhaps resort to nuclear use. Specifically, Moscow might be emboldened to make nuclear threats during a crisis because NATO cannot easily issue similar warnings in response. And, in the event of a conflict, it might be confident that a nuclear attack would not lead to a nuclear reprisal given the possibility that the United States would have to employ strategic weapons, which

56 Although Russian efforts at intimidation might entail nuclear threats alone, they could also entail efforts at subversion (often referred to as "hybrid war") that are backstopped by the implicit or explicit threat of nuclear use. See, for example, the discussion in Matthew Kroenig, "Facing Reality: Getting NATO Ready for a New Cold War," *Survival*, 57, No. 1, February/March 2015.

could heighten the risk of an uncontrollable conflagration. In fact, given that risk, NATO might opt to back down rather than absorb additional nuclear strikes or take the chance of triggering a massive nuclear exchange.

In sum, these types of tailored nuclear threats and limited nuclear use scenarios could present the United States with pre-war and intra-war deterrence challenges that differ from those it has been preoccupied with in the past—challenges its existing extended nuclear deterrence posture might not be well-equipped to manage.

Proliferation Concerns in the Asia-Pacific

Although Washington is only now turning its attention back to Europe, due in large part to the aggressive actions taken by Russia throughout its neighborhood and in other parts of the world, the Asia-Pacific has been at the very top of its foreign policy agenda in recent years, as evidenced by the "pivot" to the region that was first announced by the Obama administration in late 2011. One of the main reasons why the Asia-Pacific has been singled out as a priority, especially when it comes to adapting U.S. military forces and posture, is that the strategic environment there has been experiencing profound changes. This is particularly the case in Northeast Asia, where a nuclear-armed North Korea represents a significant threat to the entire region, and an increasingly capable China is well on its way to becoming a great power. Both of these developments are likely to stress U.S. security commitments and could create pressure on local allies to reconsider their decision to forgo nuclear weapons.

For decades, the international community has been working to slow, halt, or reverse Pyongyang's nuclear program. So far these efforts have produced relatively meager results. Since 2006, North Korea has conducted four nuclear weapons tests, clearly establishing itself as the latest addition to the nuclear club. Although its program is shrouded in secrecy, public estimates suggest that it probably has between ten and sixteen nuclear weapons in its arsenal, including some weapons fueled by plutonium and others fueled by highly enriched uranium. It may also have enough fissile material stockpiled to make nearly two-dozen weapons in total.[57] At the same time, North Korea has been steadily building up its inventory of ballistic missiles (which would be its principal and perhaps only nuclear delivery system) and has been making qualitative improvements to these forces. According to one Pentagon report, Pyongyang "has

57 Joel S. Wit and Sun Young Ahn, *North Korea's Nuclear Futures: Technology and Strategy* (Washington, DC: US–Korea Institute at SAIS, 2015); and David Albright, *North Korea Plutonium and Weapon-Grade Uranium Inventories* (Washington, DC: Institute for Science and International Security, updated October 7, 2015). North Korea's leader, Kim Jong-un, has also claimed that his country has developed a more powerful hydrogen bomb, although most analysts are skeptical. See Choe Sang-Hun, "Kim Jong-Un's Claim of North Korea Hydrogen Bomb Draws Skepticism," *New York Times*, December 10, 2015; and Jeffrey Lewis, "Did Somebody Say H-Bomb?" *38 North*, December 14, 2015, available at http://38north.org/2015/12/jlewis121415/.

an ambitious ballistic missile development program and has deployed mobile theater ballistic missiles capable of reaching targets throughout the ROK, Japan, and the Pacific theater."[58]

Moreover, the threat from North Korea is unlikely to diminish and might even grow substantially. Given the personalized character of the regime and the impoverished state of the country, the United States and its allies will need to remain on guard against a variety of threats, from deliberate provocations by a mercurial leader to diversionary attacks that distract from internal strife. Yet potential developments in North Korean military capabilities could make these scenarios far more dangerous. As one study notes, North Korea could have upwards of fifty or even a hundred nuclear weapons by 2020, including weapons with higher yields that can be mounted on more advanced short-range, intermediate-range, and intercontinental ballistic missiles.[59] In fact, some U.S. officials have publicly stated that North Korea might indeed have the ability to field nuclear warheads small enough and sturdy enough to be carried by its KN-08 ICBM, although the missile itself does not yet appear to be reliable enough to serve as a delivery vehicle.[60]

The significance of these developments is straightforward. The combination of a larger stockpile of warheads, a larger inventory of mobile delivery systems, and longer-range weapons would increase both the survivability and the reach of North Korea's nuclear arsenal—and therefore potentially enhance its coercive leverage over neighbors and the United States. For instance, Washington might find it extraordinarily difficult to disarm Pyongyang during a crisis or conflict given the sheer number of targets it would have to locate and neutralize, along with the inherent challenges of suppressing or destroying targets that are on the move or could be relocated quickly. Moreover, Pyongyang might be able to credibly threaten attacks against Guam, Hawaii, or the continental United States if hostilities broke out.

Under these conditions, North Korea might become even more willing to provoke crises, heighten tensions, or escalate a confrontation by employing nuclear weapons; not only would it be able to employ a handful of weapons while keeping others in reserve to deter retaliation or compel additional concessions, but it might also calculate that the United States would be unwilling to intervene in a local war once its territory was seriously at risk.[61] In other words,

58 Office of the Secretary of Defense, *Annual Report to Congress: Military and Security Developments Involving the Democratic People's Republic of Korea* (Washington, DC: Department of Defense, 2014), p. 10, available at http://www.defense.gov/Portals/1/Documents/pubs/North_Korea_Military_Power_Report_2013-2014.pdf. See also James R. Clapper, Director of National Intelligence, "Statement for the Record: Worldwide Threat Assessment of the US Intelligence Community," Senate Armed Services Committee, February 26, 2015, p. 6, available at http://www.dni.gov/files/documents/Unclassified_2015_ATA_SFR_-_SASC_FINAL.pdf.

59 Wit and Ahn, *North Korea's Nuclear Futures*.

60 Aaron Mehta, "US: North Korean Nuclear ICBM Achievable," *Defense News*, April 8, 2015; Elizabeth Shim, "U.S. Commander: North Korea has Capacity to Miniaturize Nuclear Warheads," *UPI*, October 9, 2015; and Elizabeth Shim, "Pentagon: North Korea Not Yet Capable of Striking U.S.," *UPI*, April 14, 2016.

61 Shane Smith, *Implications for US Extended Deterrence and Assurance in East Asia* (Washington, DC: US–Korea Institute at SAIS, 2015). These dangers would apply to Japan as well as South Korea, both of which could be the targets of North Korean aggression.

these developments suggest that the North Korean nuclear arsenal is unlikely to remain a recessed deterrent that is purely intended to defend the regime against the United States and could instead become an increasingly effective tool of compellence and coercion.

Although these threats are extremely serious, they pale in comparison to the challenge of China's rise, especially over the long run. Thanks to decades of unprecedented economic growth, China has already far surpassed Japan as the second-largest economy in the world and is on pace to nearly equal the United States in gross domestic product (GDP) by 2030, at least according to recent projections.[62] Meanwhile, Beijing has also been implementing an ambitious program of military modernization and reform. Not only is the People's Liberation Army (PLA) becoming a more technologically sophisticated, well-trained, and professional force, but it has also been able to undermine many of the advantages that Japan (which has long been the strongest local military power in Northeast Asia) and the United States (which remains the strongest military power in the world) have taken for granted—including the ability to operate with near impunity across China's maritime flanks.

One thrust of Beijing's military modernization program has been enhancing the survivability of its relatively small nuclear arsenal—for instance, by developing new SSBNs and submarine-launched ballistic missiles; fielding solid-fueled, road-mobile ICBMs; and deploying multiple independently targetable warheads on some of its older, silo-based ICBMs.[63] More worrisome, however, are the changes it is now making to its conventional military doctrine, force structure, and warfighting concepts.

For much of its history, the People's Republic was preoccupied with deterring or fending off a Soviet attack from the north. Given its large population but limited technological base, it planned to draw in and wear down an invading army. Today, however, it is in the process of moving away from continental defense and embracing "counter-intervention," or what many U.S. analysts refer to as anti-access/area denial (A2/AD).[64] Specifically, the PLA aims to defend its eastern air and maritime approaches (and perhaps carve out a sphere of influence

62 See, for example, Jeanna Smialek, "These Will Be the World's 20 Largest Economies in 2030," *Bloomberg Business*, April 10, 2015.

63 Office of the Secretary of Defense, *Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2015* (Washington, DC: Department of Defense, April 2015). China's nuclear arsenal is estimated to include some 260 warheads and is slowly growing in size. See Hans M. Kristensen and Robert S. Norris, "Chinese Nuclear Forces, 2015," *Bulletin of the Atomic Scientists*, 71, No. 4, 2015. Despite improvements to its arsenal, Beijing still appears wedded to an assured retaliation strategy for the time being. See Fiona S. Cunningham and M. Taylor Fravel, "Assuring Assured Retaliation: China's Nuclear Posture and U.S.–China Strategic Stability," *International Security*, 40, No. 2, Fall 2015.

64 In general, anti-access capabilities are used to prevent or constrain the deployment of opposing forces into a distant theater of operations, whereas area-denial capabilities are used to restrict their freedom of maneuver once in theater. See Andrew F. Krepinevich, "The Pentagon's Wasting Assets," *Foreign Affairs*, 88, No. 4, July/August 2009. Whether or not "counter-intervention" is an accurate term to describe Chinese military strategy has been up for debate recently. See, for example, M. Taylor Fravel and Christopher P. Twomey, "Projecting Strategy: The Myth of Chinese Counter-Intervention," *The Washington Quarterly*, 37, No. 4, Winter 2015; and the response by Timothy Heath and Andrew S. Erickson, "Is China Pursuing Counter-Intervention?" *The Washington Quarterly*, 38, No. 3, Fall 2015.

in and around its near seas) by fielding a variety of land-attack, sea-denial, counter-air, and counter-network capabilities. This includes a growing arsenal of highly accurate ballistic and cruise missiles; an increasingly modern air force; extremely quiet and well-armed submarines; and sophisticated anti-satellite, cyber warfare, and electronic warfare weapons.

Notably, this suite of capabilities could enable the PLA to hold at risk the forward bases, high signature platforms, lines of communication, and information networks that the United States depends upon to project power into the region.[65] In addition, China is making considerable investments in more traditional tools of power projection, such as blue water surface naval platforms, as well as paramilitary units for low-end contingencies, including a rapidly expanding fleet of coast guard vessels.

Collectively, these modernization efforts seem to be having several effects: emboldening Beijing to act more assertively toward its neighbors, especially in longstanding territorial disputes in the East and South China Seas; enabling Beijing to narrow the relative power gap with Tokyo, if not surpass its local rival in terms of combat capability; and undermining Washington's ability to reliably defend some of its closest allies in the event of a regional conflict.

What are the implications of North Korea's expanding nuclear capabilities and China's growing conventional military power for U.S. extended nuclear deterrence? One of the chief incentives to provide other nations with security commitments and keep them under the nuclear umbrella is to dissuade them from pursuing nuclear weapons of their own. In other words, extended deterrence can be an important non-proliferation tool, whether this is the reason that security guarantees are offered in the first place or it becomes the rationale for maintaining them even after threats have declined.[66] This is especially true for allies like South Korea and Japan, which seemingly have the financial, material, and human resources necessary to develop nuclear weapons if they choose to do so. Unfortunately, the developments outlined above could increase pressure on each of these nations to reconsider their commitment to nuclear non-proliferation.[67]

For instance, if North Korea succeeds in building a nuclear arsenal that is large enough and secure enough to withstand an attack and conduct a reprisal, and especially if it gains the ability to launch nuclear weapons against U.S. territory, then policymakers in Seoul might begin to doubt whether the United States would really employ nuclear weapons on their nation's

65 See, for example, Krepinevich, "The Pentagon's Wasting Assets"; and Montgomery, "Contested Primacy in the Western Pacific."

66 Francis J. Gavin, "Strategies of Inhibition: U.S. Grand Strategy, the Nuclear Revolution, and Nonproliferation," *International Security*, 40, No. 1, Summer 2015.

67 David Santoro, "Will America's Asian Allies Go Nuclear?" *The National Interest*, January 30, 2014, available at http://nationalinterest.org/commentary/will-americas-asian-allies-go-nuclear-9794?page=show.

behalf.[68] Alternatively, they might consider an independent nuclear capability as a helpful tool when it comes to managing lower-level provocations.[69] That is, if Pyongyang is willing to sink South Korean naval vessels or launch artillery strikes against inhabited islands because it has an escalation advantage on the Peninsula, Seoul might conclude that its own nuclear weapons would provide it with greater freedom to respond in kind—and therefore might deter these types of attacks in the first place.

As for Japan, it could eventually face a different calculus, although it too might confront some of the same challenges with respect to North Korea. Specifically, if it cannot keep pace with China's growing military power, and if the United States cannot adapt its own forces and posture quickly enough to provide an effective conventional deterrent, then policymakers in Tokyo might conclude that a small nuclear deterrent is the only way to offset a sharply deteriorating conventional military balance.[70]

Finally, these two trends could interact with one another in troubling ways. Given the lingering tensions that exist between South Korea and Japan, should one of these nations take steps toward developing nuclear weapons, the other would face added pressure to emulate its neighbor.[71] Moreover, if both went nuclear, other U.S. allies might begin to question whether Washington's extended deterrent guarantees would endure.[72]

Competing Security Guarantees in the Middle East

Arguably the single greatest threat to U.S. security commitments across the Middle East in recent years has been the prospect of a nuclear-armed Iran. For more than a decade, Washington has been working with the international community to place limits on Tehran's civil nuclear program and ensure that it does not have any military dimensions. Meanwhile, fears that these efforts could fail—and that Iran could emerge as a latent, virtual, or fully

68 This is particularly the case given the unpredictability of the North Korean regime, which might serve to undermine or even neutralize American nuclear superiority, at least in the eyes of allies. Put another way, although Washington will retain an enormous nuclear advantage over Pyongyang, the prospect of a devastating reprisal might not deter a seemingly irrational foe under certain conditions—or so observers in allied capitals might believe.

69 Martin Fackler and Choe Sang-Hun, "South Korea Flirts with Nuclear Ideas as North Blusters," *New York Times*, March 10, 2013; and Barbara Demick, "More South Koreans Support Developing Nuclear Weapons," *Los Angeles Times*, May 18, 2013.

70 On the prospect of Japan pursuing its own nuclear weapons, see Llewelyn Hughes, "Why Japan Will Not Go Nuclear (Yet)," *International Security*, 31, No. 4, Spring 2007; James R. Holmes and Toshi Yoshihara, "Thinking about the Unthinkable: Tokyo's Nuclear Option," in Toshi Yoshihara and James R. Holmes, eds., *Strategy in the Second Nuclear Age: Power, Ambition, and the Ultimate Weapon* (Washington, DC: Georgetown University Press, 2012); and Richard J. Samuels and James L. Schoff, "Japan's Nuclear Hedge: Beyond 'Allergy' and Breakout," in Ashley J. Tellis, Abraham M. Denmark, and Travis Tanner, eds., *Strategic Asia 2013–14: Asia in the Second Nuclear Age* (Seattle, WA: National Bureau of Asian Research, 2013).

71 Mark Fitzpatrick, *Asia's Latent Nuclear Powers: Japan, South Korea and Taiwan* (New York: Routledge/The International Institute for Strategic Studies, 2016), p. 13.

72 Rod Lyon, "The Challenges Confronting U.S. Extended Nuclear Assurance in Asia," *International Affairs*, 89, No. 4, 2013, pp. 937–938.

declared nuclear-weapons state—have raised a host of concerns.[73] In particular, Gulf Arab nations might become more reticent to stand against Iran and allow it to dominate the region. Alternatively, they might pursue their own nuclear weapons programs to take away Tehran's advantage. Finally, they might distance themselves from the United States and seek out other security providers.[74]

In some respects, the third possibility appears to be the most likely. Given that Gulf Cooperation Council (GCC) allies such as Saudi Arabia and the United Arab Emirates have considerable wealth, possess advanced conventional military equipment, and continue to outspend Iran on defense, it seems doubtful that they would engage in outright bandwagoning behavior—although they could certainly become more cautious in their dealings with Tehran. Moreover, the financial requirements, technical demands, and potential diplomatic price of pursuing indigenous nuclear weapons programs would all make this a very costly and risky form of balancing, one that might not produce any benefits for quite some time, if it produced any benefits at all. By contrast, another way to offset an Iranian nuclear bomb would be to seek out more robust security guarantees, something that the United States has been hesitant to provide. There are, however, other patrons who might be willing to fill that gap.

For instance, there has been frequent speculation that Saudi Arabia and Pakistan have some type of arrangement that would bring Riyadh under Islamabad's nuclear umbrella.[75] This could entail an announcement by Pakistan that its nuclear arsenal would be used to defend Saudi Arabia from an attack and retaliate against an aggressor; the deployment of Pakistani forces armed with nuclear weapons to Saudi territory; or the development of dual-key nuclear sharing arrangements similar to those that exist between the United States and some of its NATO allies.[76] Looking further into the future, other security providers could emerge. China, for example, clearly has aspirations to become a global power; it is highly dependent on oil

73 A "latent" nuclear power has the capability to build nuclear weapons in a relatively short period of time but chooses not to do so, whereas a "virtual" nuclear nation develops and deploys nuclear weapons but forgoes conducting nuclear tests or openly acknowledging its arsenal. See Avner Cohen and Benjamin Frankel, "Opaque Nuclear Proliferation," *Journal of Strategic Studies*, 13, No. 3, September 1990; Peter D. Feaver, "Proliferation Optimism and Theories of Nuclear Operations," *Security Studies*, 2, Nos. 3–4, Spring/Summer 1993, p. 175; and Ariel E. Levite, "Never Say Never Again: Nuclear Reversal Revisited," *International Security*, 27, No. 3, Winter 2002/03.

74 For discussions of these possibilities, see Eric S. Edelman, Andrew F. Krepinevich, and Evan Braden Montgomery, "The Dangers of a Nuclear Iran: The Limits of Containment," *Foreign Affairs*, 90, No. 1, January/February 2011.

75 See, for example, *Chain Reaction: Avoiding a Nuclear Arms Race in the Middle East*, Report to the Committee on Foreign Relations, United States Senate, One Hundred Tenth Congress, Second Session, February 2008 (Washington, DC: Government Printing Office, 2008); and Christopher Clary and Mara Karlin, "The Pak–Saudi Nuke, and How to Stop It," *The American Interest*, 7, No. 6, June 2012. These suspicions grew out of Saudi Arabia's financial support to Pakistan during the period when it was developing its nuclear weapons program, and they have persisted in part thanks to Islamabad's expanding nuclear arsenal.

76 The search for other security providers could also be a more direct path to proliferation. In an extreme scenario, for example, Pakistan could simply provide Saudi Arabia with nuclear weapons or the technology needed to build them. Yet there are reasons to view this possibility with additional skepticism, particularly when it comes to the supply side of the equation. Simply put, patrons who offer nuclear weapons to their clients would reap few benefits in comparison to offering them security commitments instead—benefits that might include gaining greater leverage over a client or undermining the influence of other security providers like the United States.

from the Middle East to fuel its growing economy; it is building a more survivable nuclear arsenal with greater reach; and it might one day look to undermine the U.S. position as the most influential outside actor in the Middle East.

Although some analysts would argue that these scenarios are not realistic, at least not today, they reflect two very real concerns: U.S. allies who feel seriously threatened by Iran and insufficiently assured by Washington might look elsewhere for support; and, in the "second nuclear age," the number of potential security providers is increasing.[77]

Of course, the agreement between the P5+1 (the five permanent members of the UN Security Council plus Germany) and Iran to place limits on the latter's nuclear program in exchange for sanctions relief has surely dampened these concerns for the time being. Nevertheless, it might not eliminate them over the long run for a number of reasons: the agreement legitimizes Iran's uranium enrichment program; provides Iran with the ability to make qualitative improvements in its fuel-cycle technology; gives Iran the time to further harden its nuclear facilities by investing resources in more advanced defenses; and, perhaps most important of all, increases suspicions on the part of some local allies that the United States plans to pull back from the region in order to concentrate its attention elsewhere—and might even be seeking a broader rapprochement with Iran despite Tehran's hostility toward its neighbors.[78]

Moreover, U.S. tools to alleviate these suspicions are somewhat limited. For instance, while it can engage in massive conventional arms sales to local allies and reiterate its commitment to prevent threats to their sovereignty, it is highly unlikely that Washington would enter into any formal alliances with its most vulnerable allies in the region, especially given the popular and political resistance that would likely emerge within the United States.[79]

77 Indeed, the success in 2015 of Russian military intervention to bolster the Assad regime may be a harbinger of things to come. One already can see the potential risks that patronage by another outside nuclear power can create since one of the strongest arguments being wielded against the imposition of a safe haven for refugees enforced by a no-fly zone is the potential for escalation with a nuclear-armed adversary inherent in the situation.

78 See, for example, Eliot A. Cohen, Eric S. Edelman, and Ray Takeyh, "Time to Get Tough on Iran: Iran Policy after the Deal," *Foreign Affairs*, January/February 2016. These fears could be heightened by the discourse in the current U.S. political cycle, which has tended to highlight U.S. energy self-sufficiency, the counterproductive nature of U.S. military interventions, and free riding on the part of U.S. allies.

79 Some policymakers have hinted at this option in the past. The most notable example was then-Secretary of State Hillary Clinton, who declared in 2009 that the United States might extend a "defense umbrella" over the region if Iran acquired nuclear weapons. See Paul Richter, "U.S. May Put Up 'Defense Umbrella' over Middle East," *Los Angeles* Times, July 23, 2009. When pressed to do so, however, Washington has demurred. For instance, in advance of a high-profile meeting between President Obama and officials from GCC nations at Camp David in May 2015, which was held to discuss the impending deal between the P5+1 and Iran, there were numerous reports that Gulf allies wanted formal security commitments in exchange for supporting the arrangement. This demand was expected to generate heavy opposition on Capitol Hill, however, and did not result in any written guarantees. See Jay Solomon and Carol E. Lee, "Gulf States Want U.S. Assurances and Weapons in Exchange for Supporting Iran Nuclear Deal," *Wall Street Journal*, May 2, 2015; and Carol E. Lee and Jay Solomon, "U.S., Arab Allies Find Accord on Iran," *Wall Street Journal*, May 14, 2015. Nevertheless, the joint statement released after the meeting declared "The United States is prepared to work jointly with the GCC states to deter and confront any external threat to any GCC state's territorial integrity that is inconsistent with the UN Charter." See The White House, Office of the Press Secretary, "U.S.–Gulf Cooperation Council Camp David Joint Statement," May 14, 2015, available at https://www.whitehouse.gov/the-press-office/2015/05/14/us-gulf-cooperation-council-camp-david-joint-statement.

Why should the United States care about the prospect of other nations extending nuclear deterrence into the Middle East? Two reasons stand out. The first is that Washington would lose significant leverage over local allies if they were no longer as dependent on it to protect their sovereignty, even if they did not fully defect from the U.S. camp. The U.S. would therefore have a diminished ability to restrain them from taking destabilizing actions or to push them in a positive direction across a range of issues. The second is that Washington could face more serious crises in the future. For instance, if Pakistan or China had security commitments to local nations, then crises in South Asia or East Asia could quickly spread to the Middle East. That, in turn, could make escalation management and crisis diplomacy far more difficult.

CHAPTER 4

The Options for Adapting Extended Nuclear Deterrence

Presuming the United States does not simply cast aside its existing grand strategy and retrench from one or more regions, it will need to address the existing and emerging challenges described above.[80] This is especially true if Russia hews to a revisionist agenda and becomes even more willing to use nuclear coercion; if North Korea upgrades and expands its nuclear arsenal; if China enhances its strength and takes steps to weaken the international order; and if Iran circumvents or abandons its nuclear agreement with the P5+1. Under these conditions, the defense of Europe could grow increasingly difficult, allies in Northeast Asia could face significant pressure to acquire their own nuclear capabilities, and partners in the Middle East might seek out security guarantees from other nations. How, then, can the United States mitigate capability and credibility gaps in Europe? How can it avoid further proliferation in Northeast Asia? And how can it preserve its near monopoly on extended nuclear deterrence in the Middle East?

There are, of course, a variety of ways to deter adversaries and assure allies, such as changes in declaratory policy and conventional forces. The purpose of this chapter, however, is to focus on how the United States might alter its extended nuclear deterrence postures to address these challenges. Specifically, it outlines a number of possible options for adapting the institutional foundations of U.S. alliances as well as the military forces that Washington uses to extend its

80 A number of international relations scholars in particular have called for the United States to scale back its overseas commitments and return to a grand strategy of offshore balancing, which, they argue, would enhance its security. Yet the possibility that pulling back could embolden revisionist states to challenge the status quo and encourage former allies to acquire nuclear weapons has kept this point of view outside the mainstream. This report assumes that the United States does indeed maintain its existing grand strategy and does not abandon its allies, and therefore might need to adapt the mechanisms by which it extends deterrence given changes in the security environment. On offshore balancing, see especially Christopher Layne, *The Peace of Illusions: American Grand Strategy from 1940 to the Present* (Ithaca, NY: Cornell University Press, 2006); and Barry R. Posen, *Restraint: A New Foundation for U.S. Grand Strategy* (Ithaca, NY: Cornell University Press, 2014).

nuclear umbrella, some or all of which might prove useful if escalation management becomes more difficult, prospects for proliferation increase, and other nations consider getting into the extended nuclear deterrence business.

Adapting Extended Nuclear Deterrence in Europe

Despite the challenges that the United States now faces in Europe due to Russian aggression, the institutional foundations of its regional security commitments remain strong. So long as other NATO members are willing to host U.S. nuclear weapons in peacetime and deliver them during a conflict, the unique structure of the alliance will continue to underpin the credibility of U.S. extended deterrence. Moreover, existing modernization plans (namely, prolonging the lifespan of B61 gravity bombs and replacing 4th-generation U.S. and allied dual-capable aircraft with fifth-generation F-35As) will result in modest, overdue, but important capability upgrades. The impact of those upgrades will almost certainly by lessened, however, until NATO improves the readiness level of these nuclear forces. Finally, and perhaps most important of all, Moscow's seizure of Crimea and operations in Ukraine, along with its efforts to intimidate NATO members and non-NATO countries alike, have probably guaranteed that the alliance will not take any precipitous steps on the road to denuclearization, at least in the near future (although this possibility cannot be dismissed).

Nevertheless, there are other measures that the United States could spearhead, particularly on the institutional side of the ledger, which have the potential to enhance the credibility of its security commitments and discourage Russia from engaging in nuclear coercion—especially if Moscow persists along its current path.

One option, for instance, would be to alter NATO's existing organizational structure by incorporating additional member-states into the nuclear delivery mission—not just via participation in supporting operations but also through changes in nuclear sharing arrangements.[81] Specifically, by including nations that are the most directly threatened by a resurgent Russia, the most determined to counter Moscow's provocations, the most adamantly in favor of preserving NATO's nuclear status, and the most willing to engage in nuclear operations if necessary (characteristics that generally go hand in hand), the United States would send a clear signal that it will not cede escalation dominance to a revisionist rival. Doing so would also serve as a hedge against the possibility that existing members of NATO's nuclear sharing club might scale back their participation or even abandon their special position one day—allies such as Germany, which has voiced reservations about maintaining U.S. nuclear weapons in Europe and has not yet committed to acquiring new dual-capable aircraft, even as its Tornados approach retirement.[82]

81 Brad Roberts, *The Case for Nuclear Weapons in the 21st Century* (Stanford: Stanford University Press, 2016), pp. 194–195.

82 Germany currently plans to replace its Tornados with Eurofighter Typhoons that, according to reports, are not capable of carrying nuclear weapons. See Rachel Oswald, "U.S. Tactical Nuclear Arms Mission Could Shift among NATO Jets," *Global Security Newswire*, March 26, 2014, available at http://www.nti.org/gsn/article/aircraft-could-be-given-nato-tactical-nuclear-arms-mission/.

A logical candidate for joining NATO's nuclear sharing arrangements is Poland.[83] Not only has Warsaw been vocal about the enduring value of the U.S. nuclear umbrella, to include the role of nuclear weapons based in Europe, but it has also joined NATO nuclear delivery exercises, albeit presumably in a supporting role alone.[84] There have also been reports that senior officials want the alliance to abandon the 1997 NATO–Russia Founding Act, which declares that NATO members "have no intention, no plan and no reason to deploy nuclear weapons on the territory of new members, nor any need to change any aspect of NATO's nuclear posture or nuclear policy–and do not foresee any future need to do so."[85] In fact, some officials have apparently suggested that Poland would indeed consider taking on a nuclear sharing role.[86]

What would be required to put this option into practice? At the most basic level, Washington would have to take two major steps. First, it would need to provide Poland with dual-capable aircraft, either properly configured F-16s or, eventually, F-35As. Second, it would need to grant Warsaw access to forward-based B61s. The most obvious way to do so would be to construct the appropriate storage facilities on Polish territory. Yet this would create a new set of potentially vulnerable targets closer to Russia—presuming the allies could even find the funding necessary to build these specialized facilities given other priorities and resources limitations. Many NATO members might also oppose the move as too provocative. Alternatively, it might be possible to organize a pact that would allow a squadron of dual-capable Polish fighter-aircraft to be stationed at (or rotationally deploy to) other European bases where nuclear weapons are stored.[87]

Adapting Extended Nuclear Deterrence in the Asia-Pacific

In Europe, the United States coordinates closely with its allies when it comes to nuclear operations and continues to maintain forward-based nuclear forces that are dedicated to the defense of those allies. In the Asia-Pacific, by contrast, these types of nuclear coordination mechanisms have never existed, and Washington no longer keeps nuclear weapons on foreign

83 Jim Thomas, "How to Put Military Pressure on Russia," *Wall Street Journal,* March 9, 2014.

84 Hans Kristensen, "Polish F-16s in NATO Nuclear Exercise in Italy," *Strategic Security Blog,* Federation of American Scientists, October 27, 2014, available at https://fas.org/blogs/security/2014/10/steadfastnoon/.

85 "Minister: Poland Wants NATO–Russia Deal Scrapped," *Agence France–Presse*, November 25, 2015, available at http://www.defensenews.com/story/defense/2015/11/25/minister-poland-wants-nato-russia-deal-scrapped/76395554/. For the text of the document, see NATO, "Founding Act on Mutual Relations, Cooperation and Security between NATO and the Russian Federation," May 27, 1997, available at http://www.nato.int/cps/en/natohq/official_texts_25468.htm.

86 Associated Press, "Poland Denies it Wants US Nukes after Official Says Defense Ministry Considering Request," *U.S. News and World Report*, December 6, 2015, available at http://www.usnews.com/news/world/articles/2015/12/06/poland-considers-asking-for-access-to-nato-nuclear-weapons.

87 Larsen, "US Extended Deterrence and Europe," p. 56. Although the new Polish government would seem enthusiastic about such arrangements, concerns in the West about some of the domestic steps it is taking could seriously impede any efforts along these lines in the immediate future. See, for example, "Poland's New Right Wing Leaders Have Crossed a Line," *Washington Post*, December 22, 2015.

territory. This situation may need to change, however, if U.S. partners begin to seriously consider acquiring nuclear weapons of their own in response to growing threats in the region.

How might Washington prevent nuclear proliferation if South Korea were to decide that it needed to offset North Korea's nuclear arsenal, if Japan were to determine that it had no other option to balance against a rising China, or if both of these outcomes occurred? One possibility would be to establish mechanisms that are similar to those that can be found in Europe, including both combined nuclear planning groups and nuclear sharing arrangements. Specifically, if Seoul and Tokyo had a clearer window into how the United States intended to conduct nuclear operations and a direct role in delivering nuclear weapons, at least under certain conditions, then both allies might be willing to forgo the alternative of indigenous nuclear weapons programs—an alternative that would require enormous resources, could lead to a permanent rupture with the United States, and, unless carried out in total secrecy, might provoke costly countermeasures on the part of their local rivals (or one another).

As for Washington, moving toward combined nuclear planning and nuclear sharing would be a major departure from its traditional approach to alliances in the Asia-Pacific. Nevertheless, this might be preferable to watching two of its closest allies develop and field independent nuclear weapons. In that scenario, the United States would have no control over these weapons, including when and how they might be used. Moreover, Japanese and South Korean nuclear arsenals that were untethered to the United States could end up being a major source of instability between these two nations, irrespective of their impact on North Korea and China.[88]

As for translating this possibility into a reality, two major issues stand out. First, would the United States and its allies retain the bilateral hub-and-spoke alliance structure that has existed for many decades, or would they instead try to form a "mini-NATO" in Northeast Asia? Second, presuming that U.S. allies were equipped with dual-capable combat aircraft (which, realistically, would be the only non-strategic nuclear delivery system available to them, at least in the near term), where would Washington actually store any shared nuclear weapons that were earmarked for use by South Korea and Japan?

Although the only experience the United States has with combined nuclear planning and nuclear sharing has been in the context of a multilateral collective defense organization, the prospects of replicating that model in Northeast Asia are extremely low. Of course, it might be tempting to abandon the hub-and-spoke model in favor of a collective defense pact, at least in Washington, because tensions between Seoul and Tokyo have been a persistent source of concern for U.S. policymakers. Moreover, a move toward trilateral nuclear planning and sharing would provide a unique opportunity to transcend those tensions and foster closer ties.

88 For a thoughtful argument that the United States should avoid scaling back or severing its alliances with South Korea and Japan if they did indeed develop their own nuclear weapons, see Elbridge Colby, "Choose Geopolitics over Nonproliferation," *The National Interest*, February 28, 2014, available at http://nationalinterest.org/commentary/choose-geopolitics-over-nonproliferation-9969.

Nevertheless, South Korean and Japanese threat perceptions still differ markedly, especially with respect to China, and it seems doubtful that both sides would agree to a more narrow form of collective defense directed solely against North Korea, given that such an agreement would undoubtedly be viewed on all sides as a vehicle toward a much broader arrangement. In short, a hybrid model with bilateral nuclear planning and sharing arrangements is more plausible. Over time, however, even a hybrid model could be the stepping-stone to some type of multilateral arrangement.

As for the location of nuclear weapons, this also presents a dilemma. On the one hand, unless these weapons are forward-based in or near the theater, they might not be particularly useful in a crisis or credible as deterrent—especially air-delivered weapons that are carried by relatively short-range platforms. On the other hand, forward-based weapons can be particularly vulnerable to attack, and the political complications of stationing them abroad could create even bigger problems, especially in Japan.[89] Depending on the broader circumstances, any attempt to base nuclear weapons in Japan could very well be the cause for massive protests and political upheaval.

Therefore, one way to address these issues, and perhaps promote increased trilateral cooperation as well, would be to base nuclear weapons at a central and neutral location like the U.S. territory of Guam. This would reduce their vulnerability, mitigate blowback in South Korea and Japan, and perhaps allow the three allies to coordinate and train with one another for the nuclear delivery mission.

Adapting Extended Nuclear Deterrence in the Middle East

The United States arguably faces some of the most difficult extended nuclear deterrence challenges in the Middle East. Not only are most of its security commitments there much less robust than those in other regions, but it also has comparatively few options available when it comes to assuring allies and preventing them from seeking out other patrons.

As described above, the United States is not bound to defend its local partners by treaty or any other written agreement, even though it has publically vowed to protect them on many different occasions. Moreover, it has never permanently based any nuclear weapons in the area. Neither of these conditions appears likely to change. Looking ahead, it is implausible that the United States would be able to formalize its security commitments given the high likelihood of public and political opposition at home. And it is even more doubtful that it would be willing to put nuclear weapons on the territory of its allies given fears of instability and concerns that they might fall into the wrong hands. What could Washington do, then, if it needed to give its pledges a clear nuclear component and make them credible?

89 Although the South Korean public has voiced some support for the return of U.S. nuclear weapons to the Peninsula, the Japanese public has not expressed similar views. Toby Dalton and Yoon Ho Jin, "Reading into South Korea's Nuclear Debate," *Asia Times*, March 21, 2013, available at http://www.atimes.com/atimes/Korea/KOR-01-210313.html.

One relatively modest effort that Washington could pursue would be to increase the institutionalization of its security commitments in the region, even if it cannot or will not formalize those commitments. It might, for instance, consider putting in place official dialogues that are similar to those it has created over the past several years with South Korea and Japan (although its ability to share information in this case would likely be lower). Beginning with close allies such as Israel, Saudi Arabia, and the United Arab Emirates, and then perhaps expanding to include other GCC states, the purpose of these dialogues would be to routinize discussions about regional defense issues and provide local partners with more information about U.S. capabilities (and hopefully to imbue them with greater confidence in existing security guarantees). It could also serve has a useful forum for enhancing cooperation among partners that rarely work together in public, despite sharing common threats.

Given the constraints it is operating under, however, there are few measures that the United States can take in the near-to-medium term with respect to adapting the nuclear capabilities it relies upon for extended deterrence in the region. Perhaps the only plausible means of doing so, therefore, would be to revisit its decision to abandon sea-based non-strategic nuclear weapons.

Should Washington reintroduce tactical nuclear weapons at sea one day—either by putting nuclear gravity bombs on carriers or, more likely, by placing some future nuclear-tipped cruise missile on surface combatants or submarines—it would be able to "dedicate" part of its non-strategic arsenal to the defense of nations in the region without having to base nuclear weapons on their territory.[90] What might this look like in practice? Rather than keep these weapons at sea on a regular basis, which would limit the number of conventional munitions that U.S. ship and submarines could carry, Washington might instead base them at a central location along the periphery of the theater, such as Diego Garcia, where they could be loaded onto U.S. platforms if and when necessary. In other words, the United States could adopt an extended nuclear deterrence posture for the Middle East that is very similar to the one that it maintained for the Asia-Pacific during the 1990s and 2000s: relying on sea-based non-strategic nuclear weapons that were implicitly earmarked for local contingencies and stored "offshore" until they were needed.

Adapting Extended Nuclear Deterrence Across the Globe

Although the United States has geographically differentiated extended nuclear deterrence postures, there are certain issues that cut across different regions. Perhaps the most important are those involving the number and types of weapons that the United States relies upon to make its commitments credible. Over the past twenty-five years, Washington has progressively reduced the size of its nuclear arsenal and become increasingly reliant on its strategic

90 Placing nuclear weapons on carriers would likely require producing a nuclear-capable variant of the F-35C. For an argument in favor of this option, see Clark Murdock et al., *Project Atom: A Competitive Strategies Approach to Defining U.S. Nuclear Strategy and Posture for 2025–2050* (Lanham, MD: Rowan & Littlefield, 2015).

forces to deter adversaries and assure allies. Nevertheless, the conditions that have enabled it to do so—including the decline of great power competition, the extension of U.S. conventional military dominance, and the relative absence of rival security providers—might not hold for much longer.

Looking ahead, the United States will need to take a hard look at whether its existing and planned nuclear force structure will remain adequate to meet its objectives given the changes taking place in the security environment. This is especially true for its shrinking supply of non-strategic nuclear forces. Will Washington have enough of these weapons to simultaneously manage escalation in Europe, prevent proliferation in Northeast Asia, and convince allies in the Middle East to remain in its camp, particularly if the challenges outlined in the previous chapter become more serious? If not, what are the options for expanding its inventory, both in the near term and over the long run? At the same time, will it have the right types of non-strategic weapons to meet these challenges, especially as the proliferation of advanced air defenses and guided missiles that can target forward bases make short-range, dual-capable aircraft more vulnerable?

Efforts to address the quantitative and qualitative limitations in U.S. force structure could take a variety of forms, such as developing a follow-on to the B61-12 that could supplement and expand the pool of nuclear gravity bombs that will remain once this life-extension program is complete; equipping dual-capable aircraft with standoff nuclear weapons that might enhance their survivability and effectiveness in non-permissive operating environments; and exploring the possibility of fielding ground-based non-strategic delivery systems, including relatively short-range systems if the INF Treaty remains in effect or longer-range systems if it does not.

LIST OF ACRONYMS

A2/AD	anti-access/area denial
ALCM	air-launched cruise missile
ANZUS	Australia, New Zealand, and United States
GBSD	Ground-Based Strategic Deterrent
GCC	Gulf Cooperation Council
GLCM	ground-launched cruise missile
ICBM	intercontinental ballistic missile
INF	Intermediate-Range Nuclear Forces
IRBM	intermediate-range ballistic missile
LRSO	Long-Range Standoff
NATO	North Atlantic Treaty Organization
NPG	Nuclear Planning Group
P5+1	The five permanent members of the UN Security Council plus Germany
PLA	People's Liberation Army
QDR	Quadrennial Defense Review
ROK	Republic of Korea
SEATO	Southeast Asia Treaty Organization
SNOWCAT	Support of Nuclear Operations With Conventional Air Tactics
SSBN	nuclear-powered ballistic missile submarine
TLAM-N	Tomahawk Land-Attack Missile—Nuclear

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