The Potential Consequences of a Nuclear-Armed Iran

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Center for Strategic and Budgetary Assessments
February 2010

Prepared for the Office of Net Assessment
Office of the Secretary of Defense
Contract No: HQ003407D1011-0019

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EXECUTIVE SUMMARY

This report provides a preliminary analysis of the major security challenges that could arise *after* Iran develops a nuclear weapons capability, to include an assessment of the United States' ability to respond effectively to these challenges, and a summary of the difficulties it might confront in doing so. The objective is not, therefore, to explore the prospects for coercing, dissuading, or inducing Iran to scale back its nuclear program or abandon its ambitions, but rather to examine the potential consequences of a nuclear-armed Iran for American security interests in the Greater Middle East (i.e., from the Maghreb to the Indian subcontinent), in particular the implications for US defense policy, alliance strategy, and military capability requirements.

Chapter One assesses the strategic consequences of nuclear weapons proliferation, to include: degrading the US military's willingness and ability to project power against a growing number of nuclear-armed adversaries; emboldening already-aggressive regimes to bolster their support for terrorist, insurgent, and subversive groups; raising the prospect that these weapons will fall into the hands of non-state actors, either as the result of a direct transfer by a hostile government or, more likely, because of internal instability that causes a regime to lose control over part of its arsenal; heightening the possibility of a proliferation "cascade" or "chain reaction"; and eroding American primacy and potentially bringing an end to the "unipolar moment." It also presents a brief summary of Iran's nuclear and ballistic missile programs.

Chapter Two discusses the possible objectives motivating Iran's nuclear program, including the need to deter US military intervention, and particularly efforts to overthrow the ruling regime; the parochial interests of domestic political actors, in particular elements of the Iranian Revolutionary Guards Corps; the assumption that nuclear weapons will be a source of prestige both at home and abroad; and possibly the influence millenarian religious beliefs. In addition, it explores the incentives and disincentives that will shape Iran's future nuclear posture (that is, whether it is likely to weaponize its nuclear capability and, if so, whether it will advertise its nuclear arsenal) and the potential characteristics of a future nuclear arsenal (including different strategies to ensure survivability). Each of these issues is crucial for understanding the implications of a nuclear-capable or nuclear-armed Iran, including its susceptibility to deterrent threats and how its neighbors will respond.

Chapter Three addresses the future Israeli-Iranian military balance. Although the implications of a nuclear-armed Iran would be felt throughout the region and beyond, the most immediate and most serious impact would be on Israel, whose leaders have repeatedly stated that an Iranian nuclear-weapons capability represents an existential threat to their state. Assuming that neither Israel nor the United States conducts a military attack before Iran crosses the nuclear threshold, Israel will be forced to address three key issues: whether to launch a preventive attack *after* Iran acquires some type of nuclear-weapons capability; whether to retain, abandon, or modify its posture of nuclear ambiguity; and how to adapt its nuclear arsenal and doctrine to a newly-bipolar region.

Chapter Four examines one of the most significant potential consequences of a nuclear-armed Iran: the prospect that it will trigger further proliferation in the region, exacerbating each of the

strategic consequences described in Chapter One. This possibility has appeared increasingly realistic over the past several years, as a number of nations in the Middle East and North Africa—many of which view Iran's nuclear program as a serious threat to their security and their status—have begun to take preliminary steps in response, including measures that could lay the foundation for future nuclear weapons programs of their own. The indigenous development of nuclear weapons is, however, a long, slow, expensive, and difficult process, even for nations with considerable economic resources, and especially if outside powers attempt to constrain an aspiring nuclear nation's access to critical technology and materials. Thus, even if the proliferation of nuclear energy throughout the Middle East and North Africa poses a long-term danger, without significant external support it is unlikely that any of the nations pursuing nuclear power will be able to develop a nuclear weapons capability for ten or twenty years, and perhaps even longer. Nevertheless, there is one critical variable that could have a significant impact on the pace of a regional nuclear cascade, potentially hastening the arrival of a multipolar nuclear Middle East: Saudi Arabia's response to a nuclear-armed Iran.

If Tehran were to develop nuclear weapons, this would place tremendous pressure on the Saudis to respond in some form. Not only do the two nations have strong geopolitical reasons to balance against one another, but Sunni-Shia religious tensions would also provide an incentive for Saudi Arabia to acquire nuclear weapons of its own and counter a "Shia bomb." Although Riyadh is already pursuing a nuclear power capability—which could be the first step down a very slow road to nuclear weapons development—there are rumors that it may have an alternative option that would enable it to "go nuclear" far more rapidly, namely by exploiting its close ties to Pakistan. Avoiding further proliferation in the region following the emergence of a nuclear-armed Iran may therefore require concerted efforts to prevent Saudi Arabia from sprinting to a nuclear weapons capability via its relationship with Pakistan.

Chapter Five addresses how the United States can prevent a proliferation chain reaction in the Middle East, in particular by extending formal security commitments to American allies and partners in the region, and perhaps even bringing them under the US "nuclear umbrella." The hope, of course, is that by doing so these nations will feel less threatened by Tehran and forgo any attempts to pursue their own independent nuclear deterrents. Unfortunately, advocates of extended deterrence often overlook a host of potential complications by drawing overly-simplistic analogies with the Cold War. As a result, they assume that extended deterrence commitments will be easy to implement and maintain, credible, and effective. All of these assumptions are questionable, however. Ultimately, while extended deterrence may be one of the only promising options available to the United States to forestall a proliferation cascade, it is critical to understand the limitations and potential consequences of this approach.

Chapter Six briefly examines the possibility that efforts to dissuade nations in the Middle East from pursuing nuclear weapons could fail and a multipolar nuclear region might emerges with at least three and perhaps more nuclear-armed states. It offers preliminary answers to several questions, including: Would this environment be stable, and if not, what could the United States do to enhance stability and preserve the tradition of nuclear non-use? Chapter Seven discusses several implications for US defense policy and posture, with a focus on the steps the United States should take to prevent a proliferation cascade, how a nuclear-armed Iran in particular and proliferation in general should impact efforts to size and shape the future US nuclear arsenal, and

the growing importance of air and missile defenses. Finally, Chapter Eight offers suggestions for future research.

In addition to the main report, several appendices have been included. Appendix A contains a list of participants from all three workshops that helped inform the contents of this report, as well as agendas from each one. Appendix B is the initial briefing prepared for the first workshop. This briefing summarized the objectives of the overall project, outlined key questions for the group to address, and reviewed the history of Iran's nuclear program as well as its ballistic missile capabilities. Appendix C includes the briefing from the third workshop or "mini wargame," which summarized the scenarios that the group was asked to address and the nuclear forces that were hypothesized as available to key nations in the Middle East in 2014 and 2019. Also included is a narrative of the 2014 scenario. Appendix D is the final hotwash briefing that presents the key insights from all three workshops. Finally, Appendix E includes the rapporteur's notes from each workshop.

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INTRODUCTION

This report provides a preliminary analysis of the major security challenges that could arise *after* Iran develops a nuclear weapons capability, to include an assessment of the United States' ability to respond effectively to these challenges, and a summary of the difficulties it might confront in doing so. The objective is not, therefore, to explore the prospects for coercing, dissuading, or inducing Iran to scale back its nuclear program or abandon its ambitions, but rather to examine the potential consequences of a nuclear-armed Iran for American security interests in the Greater Middle East (i.e., from the Maghreb to the Indian subcontinent), in particular the implications for US defense policy, alliance strategy, and military capability requirements.

If Iran fields nuclear weapons over the next several years, the balance of political influence and military power in the Middle East could shift significantly in Tehran's favor, while the United States' ability to promote and defend its key interests is likely to suffer. A critic of this proposition could note that while North Korea's acquisition of nuclear weapons was predicted to have similarly dire implications, thus far US interests in Northeast Asia have not been severely compromised, although its military and diplomatic freedom of maneuver has arguably been reduced. Yet an Iranian nuclear weapons capability is likely to be far more destabilizing. North Korea is surrounded by generally friendly nuclear powers (i.e., Russia and China) or nations that are firmly under the US nuclear umbrella thanks to longstanding formal security commitments (i.e., South Korea and Japan). Pyongyang is also economically isolated, does not control critical natural resources, and already possessed a credible deterrent to American or South Korean intervention due to its large conventional military and special operations forces, its arsenal of chemical and biological weapons, its inventory of ballistic missiles and artillery tubes, and most importantly the close proximity of all these capabilities to Seoul. In short, aside from creating the possibility that Pyongyang could export nuclear weapons, fissile material, or sensitive technology to other nations and perhaps even non-state actors, its nuclear capability has conferred little additional leverage over the international community. Its impact, therefore, has been relatively limited.

Iran, on the other hand, is located in a far more complex and volatile region, one that includes several nuclear-armed powers (including Russia, Pakistan, India, and most importantly Israel, which remains, along with the United States, one of Iran's two principal adversaries) as well as a number of countries that have either pursued nuclear weapons in the past or are considered potential nuclear powers (such as Algeria, Egypt, Iraq, Saudi Arabia, Syria, and Turkey, among others). Moreover, Iran controls the world's second largest proven natural gas reserves and third largest proven oil reserves, while 40 percent of all oil transported by sea passes through the economically vital Strait of Hormuz, a narrow waterway along Iran's southern coast.[1] Finally, nearly every nation in the region has had to contend with the presence of terrorist, insurgent, or

[1] Energy Information Administration, "Country Analysis Briefs: Iran," updated February 2009, available at http://www.eia.doe.gov/emeu/cabs/Iran/pdf.pdf; and Energy Information Administration, "Country Analysis Briefs: World Oil Transit Chokepoints," updated January 2008, available at http://www.eia.doe.gov/cabs/World_Oil_Transit_Chokepoints/pdf.pdf.

subversive groups, a number of which are supported by Tehran. Sunni-Shia religious tensions are also a potential source of instability. Injecting a nuclear-armed Iran into this already volatile environment could find the United States laboring mightily to preserve regional stability and prevent the emergence of a multipolar nuclear competition. Understanding the potential consequences of a nuclear-armed Iran, the steps the United States could take to mitigate these consequences, and the challenges it is likely to face in doing so are therefore crucial areas of analysis and research.

The remainder of this report consists of eight chapters. Chapter One provides a brief background of the strategic consequences of nuclear proliferation, as well as Iran's apparent pursuit of a nuclear weapons capability. Chapter Two discusses the possible motives driving Iran's nuclear program and the factors that could shape Iran's nuclear posture and any future arsenal it may develop and deploy. Chapter Three addresses the key issues that would confront Israel once Iran crosses the nuclear threshold: the possibility of launching a preventive attack, whether to abandon its posture of nuclear ambiguity, and what changes it might make to its nuclear arsenal. Chapter Four explores the broader consequences of a nuclear-armed Iran, including the prospect that it could trigger a cascade of nuclear proliferation throughout the Middle East and North Africa. Chapter Five assesses the benefits and drawbacks of extended deterrence as a mechanism to dissuade other nations in the region from pursuing their own nuclear deterrents. Chapter Six offers some preliminary observations regarding stability in a Middle East populated by three or more nuclear-armed states if Iran's nuclear program does trigger further proliferation in the region. Chapter Seven builds on the preceding analysis and draws several implications for US strategy and military capabilities. The final chapter offers some concluding thoughts and suggestions for future research.

I. NUCLEAR PROLIFERATION AND THE IRANIAN CHALLENGE

THE EMERGING SECOND NUCLEAR AGE

The spread of nuclear weapons has arguably been a major source of concern for American policymakers ever since the United States enjoyed its short-lived monopoly of these weapons following World War II. For example, between 1945 and 1949, when the Soviet Union successfully tested its first nuclear device, US officials not only used their atomic advantage to take risks and adopt policies that they might otherwise have avoided, they also debated how long it would take the USSR to become a nuclear power, what the ramifications of this development would be, and whether the United States should attempt to cooperate with Moscow on the regulation of nuclear weapons and material.[2] These concerns persisted following the acquisition of nuclear weapons not only by the Soviet Union, but also by Britain and France. By 1963, President John F. Kennedy was expressing the widely held fear that over the next two decades a dozen or more nuclear-weapons states could emerge, a prospect he described as "the greatest possible danger and hazard."[3] This possibility appeared even more realistic following China's test of a nuclear device in 1964, which contributed to predictions that nations throughout Asia, the Middle East, Europe, and Latin America would pursue their own nuclear weapons programs.[4]

Although Kennedy's fears thankfully failed to come true, proliferation remained a serious concern throughout the 1970s and 1980s as India, Pakistan, Taiwan, South Africa, North Korea, South Korea, Argentina and a number of other nations explored, vigorously pursued, and (in several cases) acquired nuclear weapons. Nevertheless, it was not until the end of the Cold War that proliferation truly emerged as one of the core security challenges facing the United States, due to a combination of factors: the collapse of the Soviet Union, which removed the United States' principal security threat; concerns over the security of USSR's large and widely-dispersed nuclear arsenal; revelations after the 1991 Gulf War that Iraq's nuclear program had been far more advanced than outside observers had suspected; and the 1994 nuclear crisis with North Korea.

These developments notwithstanding, in the forty years since the Nuclear Non-Proliferation Treaty (NPT) entered into force the spread of nuclear weapons has continued, but at a level far below what many once feared. Yet a number of events over the past decade have demonstrated that a future where these weapons are no longer restricted to a relatively small group of nations still remains a very real possibility. In 1998, for instance, India and Pakistan both clarified what

[2] Melvyn P. Leffler, *A Preponderance of Power: National Security, the Truman Administration, and the Cold War* (Stanford: Stanford University Press, 1992).

[3] Quoted in Avner Cohen, "Most Favored Nation," *The Bulletin of the Atomic Scientists*, January/February 1995, p. 50.

[4] Francis J. Gavin, "Blasts from the Past: Proliferation Lessons from the 1960s," *International Security*, Winter 2004-2005, pp. 104-107.

many suspected when they conducted a series of nuclear weapons tests. In 2004, Pakistani scientist Abdul Qadeer (AQ) Kahn publicly confessed to his role as head of an illicit network that trafficked sensitive nuclear technology, which Kahn provided to aspiring nuclear powers such as North Korea, Libya, and Iran, possibly with the consent of the Pakistani government. In 2006, after having withdrawn from the NPT three years earlier, North Korea conducted its first test of a nuclear weapon, which it followed with a second (apparently more successful) test in 2009. In September 2007, the Israeli Air Force executed a military strike against a Syrian target that US intelligence officials later described as a covert, graphite-moderated nuclear reactor designed to produce plutonium.[5] In addition to these developments, there remains the as-yet-unresolved issue of Iran's nuclear program, which many observers suspect is intended to produce fuel for nuclear weapons. Ultimately, as one study argues, "we may very soon be approaching a nuclear 'tipping point,' where many countries may decide to acquire nuclear arsenals on short notice, thereby triggering a proliferation epidemic."[6] If so, then the world may finally be on the verge of entering a second nuclear age.[7]

STRATEGIC CONSEQUENCES OF NUCLEAR PROLIFERATION

Although the further spread of nuclear weapons is by no means given, this possibility would have a number of very dangerous ramifications, all of which would undermine the security of the United States and its ability to both promote and defend its national interests. As the 2006 National Security Strategy appropriately concluded, "The proliferation of nuclear weapons poses the greatest threat to our national security. Nuclear weapons are unique in their capacity to inflict instant loss of life on a massive scale. For this reason, nuclear weapons hold special appeal to rogue states and terrorists."[8] Specifically, there are at least five major strategic consequences of nuclear proliferation:

- Degrading the US military's willingness and ability to project power against a growing number of nuclear-armed adversaries;

- Emboldening already-aggressive regimes to bolster their support for terrorist, insurgent, and subversive groups;

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[5] "Background Briefing with Senior U.S. Officials on Syria's Covert Nuclear Reactor and North Korea's Involvement," April 24, 2008, available at http://dni.gov/interviews/20080424_interview.pdf. See also Richard Weitz, "New Insights About 2007 Israeli Air Strike in Syria," *WMD Insights*, June 2008, available at http://www.wmdinsights.com/I25/I25_ME2_NewInsights htm.

[6] Mitchell B. Reiss, "The Nuclear Tipping Point: Prospects for a World of Many Nuclear States," in Kurt M. Campbell, Robert J. Einhorn, and Reiss, eds., *The Nuclear Tipping Point: Why States Reconsider their Nuclear Choices* (Washington, DC: Brookings Institution Press, 2004), p. 4.

[7] The concept of a "second nuclear age" or "second nuclear regime" is elaborated in Fred Charles Iklé, "The Second Coming of the Nuclear Age," *Foreign Affairs*, January/February 1996; Paul Bracken, "The Second Nuclear Age," *Foreign Affairs*, January/February 2000; and Andrew F. Krepinevich, *US Nuclear Forces: Meeting the Challenge of a Proliferated World* (Washington, DC: Center for Strategic and Budgetary Assessments, 2009), chap. 2.

[8] *The National Security Strategy of the United States of America* (Washington, DC: White House, March 2006), p. 19.

- Raising the prospect that these weapons will fall into the hands of non-state actors, either as the result of a direct transfer by a hostile government or, more likely, because of internal instability that causes a regime to lose control over part of its arsenal;

- Heightening the possibility of a proliferation "cascade" or "chain reaction"; and

- Eroding American primacy and potentially bringing an end to the "unipolar moment."

Nuclear Weapons and Power Projection

If more nations acquire nuclear weapons, the prospect that the United States will find itself contemplating military operations against a nuclear-armed opponent will increase as well. There are, for example, at least two general scenarios that could lead to this outcome. First, if a nuclear-armed state could not be deterred from pursuing aggressive actions, or if intelligence reports indicated a state was on the verge of crossing certain "red lines" (for example, launching an attack against the United States or one of its allies, or transferring a nuclear weapon to a terrorist group), then the United States might be compelled to conduct a preemptive or punitive attack to roll back that nation's nuclear capability. Alternatively, a nuclear-armed state could experience internal instability or collapse into a civil war. If so, then the security of its nuclear arsenal could be jeopardized, and the United States might consider military intervention to remove the nuclear weapons and material, destroy the nuclear infrastructure before any weapons or fissile material could be removed from the country, or both.

Although it is unclear how likely these scenarios are or how the United States would respond if they occurred, neither should be ignored. For example, several of the nations that have pursued nuclear weapons in recent years—including Libya, North Korea, and Iran—have done so at least in part to deter the United States. Moreover, because of its overwhelming superiority in conventional military capabilities, prospective enemies of the United States have a strong incentive to seek nuclear weapons to offset this advantage. There is, therefore, a selection effect that influences nuclear proliferation, insofar as nations that the United States is most likely to find itself in conflict with for a variety of other reasons are precisely those nations that may have the strongest interest in acquiring nuclear weapons. At the same time, some existing nuclear powers (notably North Korea and Pakistan) as well as a number of prospective nuclear powers (including Iran and Saudi Arabia) are relatively unstable, and could be future candidates for nuclear state failure.[9]

Should the United States go to war against or intervene in a nuclear-armed state, it will undoubtedly find that the presence of these weapons makes projecting and sustaining military power far more difficult than it was in the past. Not only might US forces be threatened with a nuclear attack once inside the targeted nation, but, depending on the capabilities of its opponent (in particular the size of its nuclear arsenal and the delivery methods available to it), US theater air bases, ground force staging areas, and logistics hubs in the surrounding region could all be threatened with a nuclear attack, as could the population centers of any nations that allow the

[9] On the possibility that either North Korea or Pakistan could collapse and how the United States might respond, see Michael O'Hanlon, "What if a Nuclear-Armed State Collapses," *Current History*, November 2006.

United States to use or transit their territory, particularly for offensive strike operations. As a result, allies might not grant the United States access or over-flight rights due to the fear of nuclear retaliation; even if they did, the United States might still have to avoid massing forces that could be the target of a nuclear attack.[10] In either case, the United States' ability to project power effectively at significant distances and over an extended period of time would be severely compromised.[11]

Nuclear Weapons and Ambiguous Aggression

A number of existing and potential nuclear states have ties to terrorist, insurgent, and subversive groups. In general, it is extremely unlikely—although hardly impossible—that a nuclear-armed nation would provide one of these groups with an intact nuclear weapon or the means to fabricate one on their own. Should this occur, and if the weapon was used, and if the weapon was traced back to the provider, then the provider would almost certainly be subjected to a large-scale retaliation to effect a change in its regime. Given that state sponsors often have limited control over their non-state clients and how or where they use the weapons provided to them, transferring nuclear weapons to a non-state entity represents a risky proposition.[12] Even if this worst-case scenario is also a very low-probability scenario, the proliferation of nuclear weapons and material to known sponsors of terrorism remains a dangerous and destabilizing possibility. During the Cold War, for example, the relative strategic stability of mutually assured destruction—that is, the knowledge that both the United States and the Soviet Union were capable of absorbing a devastating nuclear first strike and still retaliating in kind—was tempered by a dynamic referred to as the "stability-instability paradox."[13] According to this perspective, a full-scale nuclear war would be so devastating for both sides that nuclear retaliation for anything short of a nuclear attack was not a credible proposition. Proponents of this view argued, therefore, that strategic stability could actually tempt and perhaps encourage the Soviet Union to pursue lower-level forms of aggression—either a conventional war in Europe or proxy conflicts in the developing world—because it would not fear escalation to the nuclear level.

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[10] See Christopher Bowie, *The Anti-Access Threat and Theater Air Bases* (Washington, DC: Center for Strategic and Budgetary Assessments, 2002), p. 51; Andrew F. Krepinevich and Robert O. Work, *A New US Global Defense Posture for the Second Transoceanic Era* (Washington, DC: Center for Strategic and Budgetary Assessments, 2007), pp. 284-285; Owen R. Coté, "Assuring Access and Projecting Power: The Navy in the New Security Environment," MIT Security Studies Program, April 2002; and Michael May and Michael Nacht, "The Real Nuclear Threat is to America's Bases," *Financial Times*, September 22, 2005.

[11] It may be possible to mitigate—although not eliminate—the threat of a nuclear attack against overseas bases or ally population centers, for example by deploying theater missile defenses along with other air defense systems, but these capabilities may not be effective enough to convince an ally to allow US forces to operate from its territory, nor would they guard against unconventional methods of delivery.

[12] Daniel Byman, *Deadly Connections: States that Sponsor Terrorism* (New York: Cambridge University Press, 2005), pp. 6, 50-52. The fear of discovery may decrease as more and more nations acquire nuclear weapons, however, due to the increased difficulty of determining the original source of any weapon used in an attack.

[13] Robert Jervis, *The Illogic of American Nuclear Strategy* (Ithaca, N.Y.: Cornell University Press, 1984), pp. 29-34.

Despite major differences between the US-Soviet rivalry during the Cold War and today's strategic environment, the proliferation of nuclear weapons to states that sponsor terrorist organizations and insurgent groups could have a similar effect. Specifically, rather than arm their clients with a nuclear weapon, possession of these weapons might embolden a state to provide increased military and logistical support for more traditional methods of attack such as bombings, raids, and assassinations, confident that its nuclear deterrent will prevent any significant retaliation by the targets of these attacks (an assumption that would fail to apply if that support included providing a nuclear weapon or even the material necessary to make one). Pakistan, for example, was encouraged by its own nuclear capability to begin arming insurgents in the disputed province of Kashmir as part of an effort to draw India into a costly irregular conflict. The Pakistani government was willing to pursue this strategy in part because it calculated that India would refrain from engaging in a large-scale reprisal for fear that the conflict might escalate out of control.[14] Moreover, this logic was apparently reinforced following the 1998 Indian and Pakistani nuclear tests. According to journalist Steve Coll, "even as the deployment of nuclear weapons made a conventional war on the subcontinent more risky…Pakistan's generals seemed to find their covert war in Kashmir more plausible."[15] Today, a prospective nuclear power like Iran may not be willing to provide a nuclear weapon to a terrorist group for the reasons cited above. Nevertheless, the possibility that a nuclear deterrent would make the regime in Tehran more willing to support or encourage aggressive behavior by these groups is certainly very real.[16]

The Possibility of Nuclear Terrorism

The third potential consequence of nuclear proliferation is a heightened possibility of nuclear terrorism. According to the National Intelligence Council's recent report *Global Trends 2025*, "If the number of nuclear-capable states increases, so will the number or countries potentially willing to provide nuclear assistance to other countries or to terrorists. The potential for theft or diversion of weapons, materials, and technology… also would rise."[17] Many potential nuclear powers, particularly those in the Middle East and North Africa, have a long history of internal instability and violence, and have hosted—either willingly or not—transnational terrorist organizations. It is also unclear whether most of these nations possess the knowledge, discipline, resources, or technology required to secure any nuclear weapons and fissile material they accumulate. For example, existing nuclear powers have taken a wide range of measures in pursuit of greater security: fortifying critical facilities used to store nuclear weapons and

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[14] International Crisis Group, *Kashmir: Confrontation and Miscalculation*, Asia Report No. 35, July 11, 2002, pp. 9-10; S. Paul Kapur, "Nuclear Proliferation, the Kargil Conflict, and South Asian Security, *Security Studies*, Autumn 2003; and Guarav Kampani, "Placing the Indo-Pakistani Standoff in Perspective," Center for Nonproliferation Studies, Monterey Institute of International Studies, no date, p. 4, available at http://cns.miis.edu/pubs/reports/pdfs/indopak.pdf.

[15] Steve Coll, "The Stand-Off," *The New Yorker*, February 13, 2006.

[16] Michael Eisenstadt, "Deter and Contain: Dealing with a Nuclear Iran," in Henry Sokolski and Patrick Clawson, eds., *Getting Ready for a Nuclear-Ready Iran* (Carlisle, PA: Strategic Studies Institute, 2005), pp. 231-232.

[17] National Intelligence Council, *Global Trends 2025: A World Transformed* (Washington, DC: National Intelligence Council, 2008), p. 63.

material; employing personal reliability programs to determine who is qualified to work in these facilities; enforcing the "two-man rule" to ensure that no single individual can arm a weapon; and developing technical safety measures such as permissive action links (PALs) and Environmental Sensing Devices (ESDs) to guarantee that weapons are safe from unauthorized use. Devising and implementing these controls could be beyond the ability of new nuclear powers, at least without significant outside support.[18] In these circumstances, the possibility that a terrorist group could purchase or steal a nuclear weapon or a significant quantity of fissile material would hardly be trivial. At the same time, the likelihood that a state would be willing to transfer these items to non-state actors would increase as well; the more nuclear powers that exist, the greater the prospect that a rogue regime could provide terrorists with a nuclear weapon and still remain anonymous. Ultimately, as Scott Sagan has argued, "The best way, by far, to prevent Islamic terrorists from possessing nuclear weapons is to prevent unstable states, especially unstable Islamic states, from possessing nuclear weapons."[19]

A Proliferation Chain-Reaction

The fourth potential consequence of increased nuclear proliferation is the prospect of further proliferation. That is, the acquisition of nuclear weapons or the development of a "latent" nuclear weapon capability on the part of one or more states could be the catalyst for other states to pursue nuclear weapons.[20] This possibility provides one of the main rationales for opposing additional nuclear proliferation, and is perhaps more worrisome than almost any aggressive action a new nuclear-armed state might take. According to Kurt Campbell, "One of the primary reasons for seeking to block various states…from achieving nuclear status has long been the concern about how such a capacity would affect neighboring states. A rogue state's successful acquisition of a nuclear weapon could trigger a range of potentially destabilizing responses, including the further proliferation of nuclear weapons beyond the rogue."[21] In short, proliferation on the part of some states could trigger an intensified security dilemma or a competition for prestige and regional influence that may lead others to respond in kind. Voicing these concerns in 2003, then-Director of Central Intelligence George Tenet warned the US Senate Intelligence Committee, "The 'domino theory' of the 21st century may well be nuclear."[22]

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[18] Scott D. Sagan and Kenneth N. Waltz, *The Spread of Nuclear Weapons: A Debate Renewed* (New York: W.W. Norton, 2003), p. 78.

[19] Ibid., p. 164. Of course, Thomas Schelling made a similar point more than twenty-five years ago, noting that "there is at least one principle I think is undeniable: the best way to keep [nuclear] weapons and weapons-material out of the hands of nongovernmental entities is to keep them out of the hands of national governments." Thomas C. Schelling, "Thinking About Nuclear Terrorism," *International Security*, Spring 1982, p. 76.

[20] *America's Strategic Posture: The Final Report of the Congressional Commission on the Strategic Posture of the United States* (Washington, DC: United States Institute for Peace Press, 2009), pp. 9-10.

[21] Kurt M. Campbell, "Reconsidering a Nuclear Future: Why Countries Might Cross over to the Other Side," in *The Nuclear Tipping Point*, pp. 25-26.

[22] Walter Pincus, "CIA Head Predicts Nuclear Race," *Washington Post*, February 12, 2003.

An End to the Unipolar Moment?

Since the end of the Cold War and the collapse of the Soviet Union, the United States has enjoyed the benefits of the "unipolar moment"—a period of historically unparalleled economic and military dominance.[23] According to a number of analysts and pundits, however, American primacy is already over or soon will be.[24] In general, these declinists attribute the end of the unipolar moment to a host of factors: a clear decrease in the United States' relative economic strength and the concomitant rise of potential great powers such as India and especially China, the historical tendency for weaker powers to emulate and eventually counterbalance stronger ones, and foreign commitments that have imposed significant costs on the United States and contributed to fears of "imperial overstretch." While these commentators may exaggerate both the magnitude of American decline and the likelihood that nations such as China—which suffers from a host of economic, political, social, and demographic problems that could slow or stall its rise—will surpass the United States in the future, they also downplay one of the most serious challenges to unipolarity and US primacy, namely the proliferation of nuclear weapons. As Peter Feaver has noted, "the spread of nuclear weapons fosters multipolarity, at the global level and at the regional level."[25]

In fact, while the rise of a peer competitor may be the most obvious and direct challenge to American primacy, nuclear proliferation could have equally troubling repercussions. Consider, for example, how several factors might interact to undermine US power and influence. American conventional military dominance has already helped to encourage several nations to develop nuclear weapons or pursue a nuclear-weapons capability, and the United States' inability to prevent or reverse these outcomes only serves to highlight the military value these weapons hold. This has two critical effects: First, it diminishes the United States' ability to translate its substantial military capabilities into effective coercive power, thus reducing its freedom of action. Second, it may also drive surrounding nations to pursue their own nuclear capability (either because they have seen that nuclear weapons effectively deter the United States, because they themselves feel threatened by the new nuclear powers, or because American security commitments suddenly appear far less credible when applied against a nuclear-armed opponent).

The second development reinforces the first, however: the more nuclear powers that emerge, the more American military power and political influence will be weakened. As Robert Jervis has recently written,

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[23] Charles Krauthammer, "The Unipolar Moment," *Foreign Affairs*, Winter 1990/1991. On the debate over the unipolar moment and US primacy, see also the essays in Michael E. Brown, Owen R. Coté Jr., Sean M. Lynn-Jones, and Steven E. Miller, eds., *Primacy and its Discontents* (Cambridge, Mass: MIT Press, 2008), in particular William C. Wohlforth, "The Stability of a Unipolar World."

[24] See, for example, Robert A. Pape, "Empire Falls," *The National Interest*, January/February 2009, p. 22; and Christopher Layne, "The Unipolar Illusion Revisited: The Coming End of American Hegemony," in *Primacy and Its Discontents*.

[25] Peter D. Feaver, "Optimists, Pessimists, and Theories of Nuclear Proliferation Operations," *Security Studies*, Summer 1995, p. 760.

> American enemies like North Korea and Iran face more immediate incentives to defend themselves, incentives that were increased but not created by the overthrow of Saddam's regime. Indeed, the U.S. has spurred proliferation by stressing the danger posed by "rogue" states with nuclear weapons, treating North Korea much more gingerly than Iraq, and indicating that it can be deterred by even a few atomic bombs. Its very efforts to stop other countries from getting nuclear weapons imply that the consequences of their succeeding will be great, a belief that is questionable but could easily be self-fulfilling. Furthermore, regional domino effects are likely: a growing North Korean nuclear force could lead Japan to develop nuclear weapons, and if Iran continues its program others in the region may follow suit. Thus both American overexpansion and the fear that it will eventually withdraw will encourage others to get nuclear weapons. This raises the question of what would remain of a unipolar system in a proliferated world. The American ability to coerce others would decrease but so would its need to defend friendly powers that would now have their own deterrents. The world would still be unipolar by most measures and considerations, but many countries would be able to protect themselves, perhaps even against the superpower. How they would use this increased security is far from clear, however.[26]

These changes could lead to one of two different outcomes. First, the United States could disengage from any international security commitments not deemed absolutely vital, with a concomitant loss of influence globally.[27] Alternatively, the United States could redouble its efforts to maintain its influence and reestablish its ability to coerce nuclear-armed opponents, a response that is potentially costly and dangerous. A proliferated world may therefore confront US policymakers with an unpalatable choice: sacrifice primacy through retrenchment or place it at risk through overextension.

IRAN: THE CENTER OF THE STORM

Given the deep suspicions surrounding its nuclear program, its contentious relations with many of its neighbors, its support for a variety of terrorist and insurgent groups, and its mutual antagonism with the United States, Iran is at the heart of concerns over both the likelihood and the consequences of nuclear proliferation. The following section provides a brief overview of Iran's apparent nuclear ambitions and its capabilities.

Iran's Nuclear Program

The origins of Iran's nuclear program actually date back to the 1950s and an agreement that was reached between Tehran and Washington as part of President Dwight D. Eisenhower's Atoms for Peace program (which was intended to provide nations in the developing world with access to nuclear technology and material for scientific research and power generation, in the hope that this would dissuade them from pursuing indigenous fuel cycle technology that could be used to

[26] Robert Jervis, "Unipolarity: A Structural Perspective" *World Politics*, January 2009, pp. 212-213. See also Michael Lind, "Beyond American Hegemony," *The National Interest*, May/June 2007.

[27] Lawrence Freedman, "Great Powers, Vital Interests, and Nuclear Weapons," *Survival*, Winter 1994/95, p. 48.

produce nuclear weapons).[28] In 1967, Iran finally received a US-supplied 5 megawatt nuclear research reactor, and the following year signed the NPT (which it ratified in 1970). Beginning in the 1970s, however, it became increasingly clear that Iran intended to develop a far larger and more ambitious nuclear program. In 1973, the shah announced plans to build twenty nuclear power reactors over the next several decades. Over the next five years Iran signed contracts with Germany to build its first power reactors at Bushehr, purchased a stake in a uranium enrichment plant in France, and invested in a uranium mine in Namibia, among other steps. Whether Iran intended to pursue a nuclear weapons capability is unclear. In 1974 the shah commented that Iran would in fact acquire nuclear weapons "without a doubt and sooner than one would think," although he subsequently reversed his position, claiming instead that Iran would forgo nuclear weapons, at least until surrounding nations began to build them as well. Regardless of his true intentions, Iran's nuclear program effectively came to a halt following the 1979 Islamic Revolution, which removed the shah from power and led many of the nation's nuclear experts to leave the country.

Despite this setback as well as opposition to nuclear weapons on the part of Iran's Supreme Leader, Ayatollah Ruhollah Khomeini, Iran apparently restarted its nuclear program beginning in the mid-to-late 1980s, signing agreements with Pakistan in 1987 and China in 1990 to train its personnel and, in the latter case, to provide a research reactor and two power reactors (an agreement Beijing abandoned under pressure from the United States). In 1995, Russia agreed to complete the Bushehr facility, to build three additional nuclear power plants, and—until Washington discovered this part of the arrangement and strongly objected—to provide Iran with gas enrichment and fuel fabrication plants. It was also during this period that Tehran began to work with the AQ Kahn network. Between 1994 and 1996 Iran apparently received designs and components for the P-1 model centrifuge as well as designs for the more advanced P-2 from Kahn and his associates.

Iran's nuclear program moved to the foreground and became a key international security issue in 2002, when an opposition group—the National Council of Resistance of Iran—publicly revealed two suspected nuclear sites that Iran had yet to declare to the International Atomic Energy Commission (IAEA): the enrichment facility at Natanz and the heavy water production plant at Arak. In an apparent effort to avoid international sanctions, Iran consented to negotiations with the EU-3 (Britain, France, and Germany) in 2003, agreed to sign the Additional Protocol to the NPT (which allows the IAEA to conduct more intrusive inspections), and chose to suspend its uranium conversion and enrichment activities (although not its construction of centrifuges). Between August 2005 and February 2006, amid a failure to reach a negotiated solution and the discovery that Iran had repeatedly violated its IAEA safeguards agreement over the past two decades, Tehran resumed its uranium conversion and enrichment efforts and ceased to comply

[28] Unless otherwise noted, the following summary or Iran's nuclear program is drawn from the following sources: Nuclear Threat Initiative, "Iran Prolife: Nuclear Overview," updated December 2009, available at http://www nti.org/e_research/profiles/Iran/Nuclear/index html; Institute for Science and International Security, "Nuclear Iran: Nuclear History," available at http://www.isisnucleariran.org/nuclear-history/; and Greg Bruno, "Iran's Nuclear Program," Council on Foreign Relations Backgrounder, updated September 29, 2009, available at http://www.cfr.org/publication/16811/irans_nuclear_program.html.

with the NPT Additional Protocol. That July, the United Nations Security Council passed the first of several resolutions calling on Iran to halt its enrichment activities.

Figure One: Iran's Key Nuclear Sites and Surrounding Defenses

In 2007, a National Intelligence Estimate prepared by the US National Intelligence Council judged that Iran did in fact have a clandestine nuclear weapons program, but that it ceased work on weaponization in 2003.[29] Recent statements by US intelligence officials have generally reaffirmed these conclusions and emphasized the uncertainty surrounding Iran's nuclear program. According to Director of National Intelligence Dennis Blair, "Although we do not

[29] National Intelligence Council, National Intelligence Estimate, "Iran: Nuclear Intentions and Capabilities," November 2007, available at http://www.dni.gov/press_releases/20071203_release.pdf.

know whether Iran currently intends to develop nuclear weapons, we assess Tehran at a minimum is keeping open the option to develop them."[30] In recent months, however, several developments have suggested that Iran's capabilities have not only increased, but that its intentions are becoming clearer.

First, Iran has continued to expand its stockpile of low-enriched uranium (LEU) hexafluoride, which can be used as fuel in nuclear power reactors after further processing.[31] It now appears that Iran has accumulated enough LEU for a single nuclear weapon, if it were further enriched to increase its U-235 concentration to 90 percent or greater.[32] Second, the recent revelation that Iran has been constructing a clandestine enrichment facility on a military base near the city of Qom has heightened suspicions that its nuclear program is not in fact peaceful. According to US officials, this facility—which can hold approximately 3,000 centrifuges—is far too small to produce a meaningful amount of reactor fuel but, depending on the type of centrifuges that are installed, could yield enough weapon-grade highly-enriched uranium (HEU) for between one and three nuclear weapons per year.[33] Third, leaked portions of an unreleased IAEA report argue that Iran does indeed have the necessary information to build an implosion-type fission weapon, and that it has conducted research and testing on the components of this type of device.[34] Perhaps not surprisingly, then, it appears that a new National Intelligence Estimate will soon be released that reverses the US intelligence community's earlier findings and concludes that Iran did not in fact halt weaponization efforts in 2003, although it may not yet have made the final decision to build a nuclear device.[35]

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[30] Dennis C. Blair, "Annual Threat Assessment of the Intelligence Community for the Senate Armed Services Committee," March 10, 2009, p. 20, available at http://www.dni.gov/testimonies/20090310_testimony.pdf.

[31] Natural uranium consists of 0.7 percent of the fissile isotope U-235. LEU, which is used to fuel nuclear power reactors, is uranium that has been enriched so that its content of U-235 is significantly higher (approximately 2.5 to 4 percent), but still less than 20 percent (in the case of Iran, its LEU is enriched to just under four percent U-235). HEU, by contrast, contains more than 20 percent U-235. The HEU used to power nuclear weapons contains approximately 90 percent U-235.

[32] David Albright and Jacqueline Shire, "Iran's Growing Weapons Capability and Its Impact on Negotiations," *Arms Control Today*, December 2009; David E. Sanger, "U.S. Says Iran Could Expedite Nuclear Bomb," *New York Times*, September 10, 2009; and Glen Kessler and Thomas Erdbrink, "Iran 'Closer' to Nuclear Weapon," *Washington Post*, September 10, 2009. Most recently, President Ahmadinejad has announced that Iran is now enriching some of its LEU to levels of 19.75 percent, which is required to power the Tehran Research Reactor. Glenn Kessler, "Analysis: Iranian Plan Will Put Nation a Step Closer to Having Material for Bomb," *Washington Post*, February 9, 2010.

[33] David E. Sanger and William J. Broad, "U.S. and Allies Warn Iran Over Nuclear 'Deception'," *New York Times*, September 26, 2009; and Joby Warrick, "Iranian Site Prompts U.S. to Rethink Assessment," *Washington Post*, October 24, 2009.

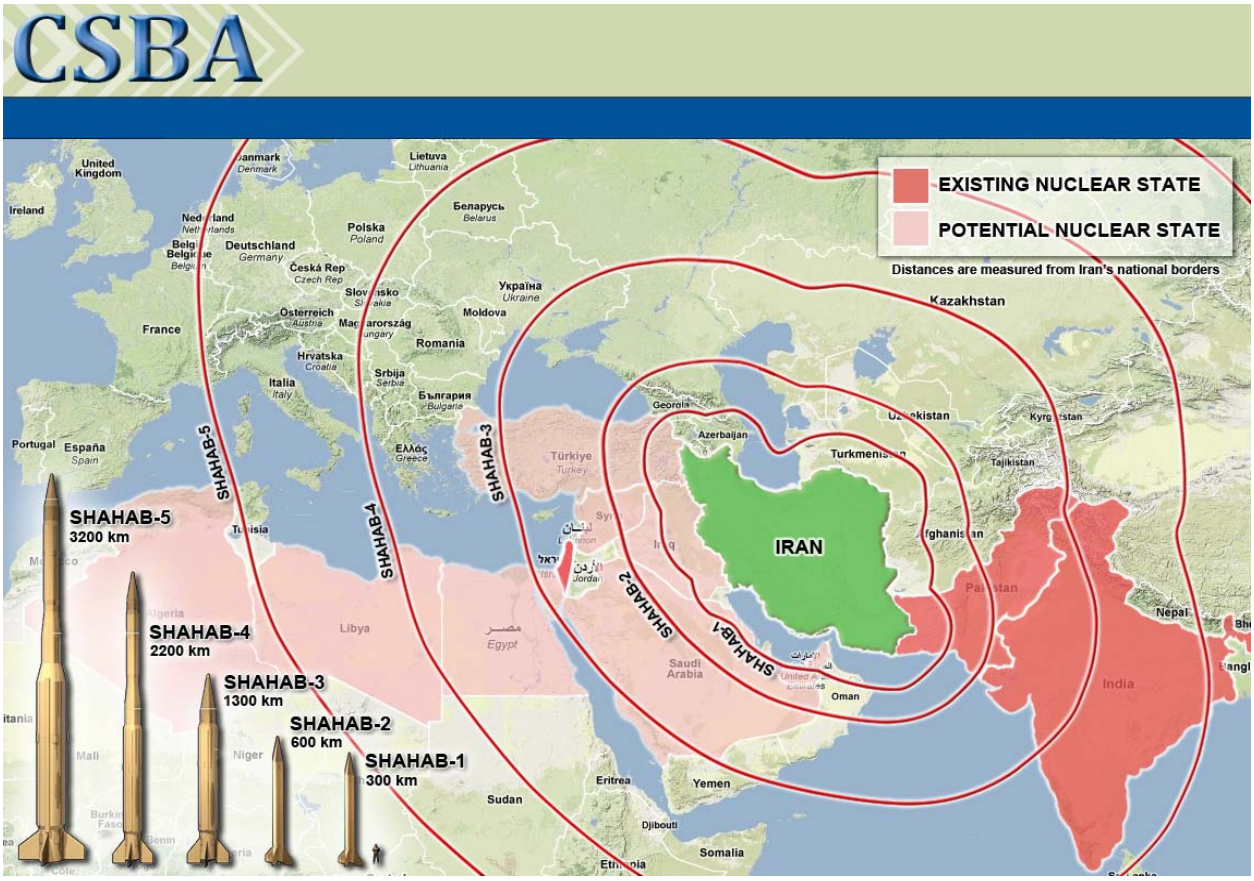
[34] William J. Broad and David E. Sanger, "Report Says Iran Has Data to Make Bomb," *New York Times*, October 5, 2009.

[35] Eli Lake, "Review Says Iran Never Halted Nuke Work in 2003," *Washington Times*, January 19, 2010.

Iran's Ballistic Missile Program

Iran has also invested considerable effort into developing ballistic missiles over the past two decades, which appear to be its nuclear delivery system of choice. Although reliable information on Iran's ballistic missile arsenal is extremely limited, it does appear to have a significant inventory of short-range missiles and a small but growing number of longer-range systems. For example, the bulk of Iran's missile inventory is made up of short-range systems like the Shahab-1 and Shahab-2. The former (better known as the export version of the Soviet Scud-B) is reported to have a nominal range of approximately 185 miles with a conventional warhead payload of about 175 pounds. The missile is inaccurate by current standards, with a nominal circular error probable (CEP) of roughly 1,000 meters.[36]

Figure Two: Iran Ballistic Missile Ranges



The Shahab-2 (a derivative of the Scud-C) represents a major improvement over the Shahab-1. According to some sources, the Shahab-2 boasts a range of 700 miles and a CEP of only 50 meters.[37] Considering the capabilities of the Russian technology from which the Shahab-2 is

[36] CEP is measured as the radius of a circle within which 50 percent of a projectile's munitions are expected to strike.

[37] Anthony Cordesman and Adam C. Seitz, *Iranian Weapons of Mass Destruction: The Birth of a Regional Nuclear Arms Race?* (Santa Barbara, CA: Praeger, 2009), p. 108.

derived, however, these figures seem inflated. It is more plausible that the missile's CEP is closer to that of the original Scud-C (700 meters) and that its range is closer to 310 miles, a figure cited in Air Force intelligence estimates.[38] In any case, the missile's range and payload (1,650-2,200 pounds) pose a serious threat to targets along the Gulf's southern littoral. Recent estimates place Iran's inventory of Shahab-1s at 150-700, and the number of Shahab-2s between 50 and 600."[39] According to the US Air Force's National Air and Space Intelligence Center (NASIC), as of April 2009, Iran possessed "fewer than 100" total short-range ballistic missile launchers.[40]

In addition to these systems, Iran also has a number of Shahab-3 (aka Zelzal-3) medium-range ballistic missiles, which have been cited as the most likely delivery platform for an Iranian-built nuclear warhead, and which have an estimated range of 600-1,000 miles.[41] How many Shahab-3s Iran actually possesses is unclear; some analysts believe the missile may only be deployed with "showpiece" or "test-bed" units. As of April 2009, Iran possesses "fewer than 50" launchers for all variants of the Shahab-3, according to NASIC.[42] The Shahab-4 is a longer range version of the Shahab-3. Its estimated range is between 1,200 and 1,700 miles.[43] Finally, Iran is reportedly working on a number of more advanced ballistic missile designs. One, the Ghadr-110, is said to incorporate solid-fuel propulsion and appears similar to China's M-9 ballistic missile.[44] Iran has also recently tested a two-stage, solid-fuel missile called the Sejil-2, which has an apparent range of 800-1,250 miles.[45] There are also reports that Iran is working on advanced versions of the Shahab missile (i.e., the Shahab-5 and Shahab-6), which would also employ solid fuel and have a range of 3,000 miles, bringing all of Europe and the easternmost parts of the United States within Tehran's targeting envelope.[46]

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[38] National Air and Space Intelligence Center, *Ballistic and Cruise Missile Threat* (Wright-Patterson AFB, NASIC, 2009), p. 11.

[39] Cordesman and Seitz, *Iranian Weapons of Mass Destruction*, pp. 103, 108.

[40] National Air and Space Intelligence Center, *Ballistic and Cruise Missile Threat*, p. 13.

[41] Albright and Shire, "Iran's Growing Weapons Capability and Its Impact on Negotiations"; and Steven A. Hildreth, "Iran's Ballistic Missile Programs: An Overview," *Congressional Research Service*, February 4, 2009, p. 3.

[42] National Air and Space Intelligence Center, *Ballistic and Cruise Missile Threat*, p. 13.

[43] Hildreth, "Iran's Ballistic Missile Programs: An Overview," p. 3.

[44] Cordesman and Seitz, *Iranian Weapons of Mass Destruction*, p. 121.

[45] Alan Cowell and Nazila Fathi, "Iran Test-Fires Missiles That Put Israel in Range," *New York Times*, September 29, 2009; and Michael Slackman, "Iran Says It Tested Upgraded Missile," *New York Times*, December 17, 2009.

[46] Cordesman and Seitz, *Iranian Weapons of Mass Destruction*, p. 123.

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II. An Iranian Nuclear Weapons Capability: Potential Objectives and Possible Characteristics

This chapter discusses the possible objectives motivating Iran's nuclear program, the incentives and disincentives that will shape its future nuclear posture (that is, whether it is likely to weaponize its nuclear capability and, if so, whether it will advertise its nuclear arsenal), and the potential characteristics of such an arsenal. Each of these issues is crucial for understanding the implications of a nuclear-capable or nuclear-armed Iran, including its susceptibility to deterrent threats and how its neighbors will respond.

What are Iran's Objectives?

In all likelihood, the regime in Tehran is motivated by a host of considerations in its apparent quest for a nuclear weapons capability. As Scott Sagan has argued, there are at least three principal reasons why nations pursue nuclear weapons: security from external threats, bureaucratic political considerations, and the symbolism or prestige associated with these weapons.[47] In addition, monocausal arguments that emphasize only one of these factors and exclude or minimize the others often prove to be overly simplistic. Although accurately understanding the motives of a leadership as closed and secretive as the one in Tehran is obviously impossible, the available evidence suggests that all three considerations—and possibly others—play a role in this case as well.

Security

First and foremost, nuclear weapons are perhaps the ultimate deterrent (even if they are employed offensively at the operational level, for example in a preemptive strike against an opposing force preparing to invade or attack), coming very close to guaranteeing the security of the nation and the survival of the regime, at least against external sources of danger. Today, Iran remains threatened by the United States, which has rightly treated the Islamic Republic as a force for instability in the region and beyond.[48] Yet Iran does not have the conventional military capability to either deter or defeat the United States. Instead, it must rely on a number of asymmetric methods and countermeasures. Iran's doctrine of deterrence, for instance, emphasizes a "strategic triad" consisting of a threat to close the Strait of Hormuz and prevent energy exports; the ability to conduct missile and air attacks, including attacks with weapons of mass destruction (WMD), against targets such as air bases, population centers, and energy infrastructure in neighboring states; and the use of terrorist attacks against US and allied targets

[47] Scott D. Sagan, "Why Do States Build Nuclear Weapons? Three Models in Search of a Bomb," *International Security*, Winter 1996/97.

[48] Of course, in addition to the threat posed by the United States, Tehran also resides in a proverbial "dangerous neighborhood" where several of its neighbors—Israel, Russia, Pakistan, and India—possess nuclear weapons. The United States, however, remains the principal external driver behind Iran's nuclear ambitions. Colin Dueck and Ray Takeyh, "Iran's Nuclear Challenge," *Political Science Quarterly*, Summer 2007, pp. 192-193.

worldwide. To defeat an invading opponent, the regime plans to take advantage of its geography, which is unfavorable for either amphibious assaults or mounted maneuver warfare; exploit its strategic depth to draw an opponent in; mobilize its large population to slow an enemy's assault; and engage in guerrilla-style warfare to punish the invader.[49]

The acquisition of nuclear weapons would complement Iran's existing asymmetric military strategy and doctrine in several ways. First, it would bolster pre-war deterrence by enabling Iran to threaten a nuclear attack against American forces in the region, key US allies (possibly causing them to deny American forces full use of any military facilities on their territory), and perhaps eventually the US homeland. Second, if deterrence failed Iran could employ its nuclear arsenal against US forces in the country or those stationed nearby to diminish the effectiveness of any American attack. Third, Iran could also hold its nuclear weapons in reserve in an effort to deter the United States from pursuing regime change as part of a military campaign.[50] In sum, "Given the asymmetry of power between the two states, a presumed nuclear capability seems to be the only viable deterrent posture against an adversary that has never accepted the legitimacy of the Iranian Revolution and has long sought to isolate and contain the Islamic Republic."[51]

Nevertheless, it is unlikely that Iran's pursuit of nuclear weapons is entirely defensive. At the very least, becoming a nuclear-armed power would provide Iran with a significant, offensive, coercive capability that would enable it to gain greater influence over its neighbors. A number of analysts have questioned the proposition that Tehran would use nuclear weapons as a "shield" to engage in conventional warfare or even to bolster its support for non-state proxies (if only because that level of support is already so high).[52] Even if it did forgo these options, which is questionable, Iran could perhaps be emboldened by its nuclear capability to intensify pressure on neighboring countries to limit their military cooperation with the United States, making it more difficult for US forces to sustain their presence in the region. It might also attempt to reap an economic advantage, for example by pressuring other oil-producing nations to adjust their production quotas in ways that benefit Tehran, or by forcing its neighbors to make concessions over disputed offshore oil and gas deposits.[53]

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[49] Steven R. Ward, *Immortal: A Military History of Iran and its Armed Forces* (Washington, DC: Georgetown University Press, 2009), pp. 5-8, 314-322; and Ward, "The Continuing Evolution of Iran's Military Doctrine," *Middle East Journal*, Autumn 2005.

[50] David Ochmanek and Lowell H. Schwartz, *The Challenge of Nuclear-Armed Regional Adversaries* (Santa Monica, CA: RAND, 2008), p. 37.

[51] Dueck and Takeyh, "Iran's Nuclear Challenge," p. 193.

[52] Ward, *Immortal*, p. 321; and Ochmanek and Schwartz, *The Challenge of Nuclear-Armed Regional Adversaries*, p. 36.

[53] Ochmanek and Schwartz, *The Challenge of Nuclear-Armed Regional Adversaries*, pp. 35-36.

Internal Politics

Although Iran's domestic politics are notoriously opaque, it appears that bureaucratic rivalries and other internal divisions have influenced its pursuit of nuclear weapons. For example, Iran's Revolutionary Guards Corps (IRGC) has become increasingly powerful under Supreme Leader Ayatollah 'Ali Khamenei, and has been described as "the spine of the current political structure and a major player in the Iranian economy."[54] The IRGC also controls Iran's ballistic missile capabilities, its chemical and biological weapons, and its nuclear program.[55] According to one analysis, the IRGC has "bolstered its domestic power and prestige by controlling nearly every aspect of nuclear research and organization."[56] This provides the highly influential group with a strong incentive to argue in favor of Iran's nuclear program, and to push for the development of a nuclear arsenal that it would likely have operational control over. At the same time, the nuclear program has also become a contentious political issue between "reformists" and "pragmatic conservatives" on the one hand and "principalists" (notably Ahmadinejad and his supporters) on the other. As one recently released study explains, after 2005 "the nuclear question was increasingly appropriated by pro-Ahmadinejad principalists for domestic, partisan advantage."[57] Specifically, "the nuclear program became a bellwether of Iranian independence and a demonstration of national pride and technological know-how."[58] Treating the nuclear issue in this way enabled Ahmadinejad to mobilize significant popular support, particularly in Iran's rural areas, which he and his supporters continue to benefit from (particularly as the struggling Iranian economy fails to improve and Iran's isolation from much of the international community persists).

International Prestige

A third major influence on Iran's pursuit of nuclear weapons is the desire for prestige, respect, and leadership, particularly within the Islamic world. According to one study, "the Islamic Republic today is perhaps best described as a highly nationalistic country that sees itself as a symbolic beacon for global Islamic enlightenment, but whose more immediate aims are rooted in a drive for regional preeminence."[59] Iranians generally view their country as a regional power due its large size, abundant resources, and rich history. Yet a significant gap exists "between the

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[54] Mehdi Khalaji, "Iran's Revolutionary Guards Corps, Inc.," Washington Institute for Near East Policy, August 17, 2007. See also Ward, *Immortal*, p. 306; and Thomas Erdbrink, "Elite Revolutionary Guard's Expanding Role in Iran May Limit U.S. Options," *Washington Post*, January 10, 2010.

[55] Ward, *Immortal*, pp. 316, 321; and Cordesman and Seitz, *Iranian Weapons of Mass Destruction*, p. 17.

[56] Frederic Wehrey, David E. Thaler, Nora Bensahel, Kim Cragin, Jerrold D. Green, Dalia Dassa Kaye, Nadia Oweidat, and Jennifer Li, *Dangerous but Not Omnipotent: Exploring the Reach and Limitations of Iranian power in the Middle East* (Santa Monica, CA: RAND, 2009), p. 30.

[57] David E. Thaler, Alizera Nader, Shahram Chubin, Jerrold D. Green, Charlotte Lynch, and Frederic Wehrey, *Mullahs, Guards, and Bonyads: An Exploration of Iranian Leadership Dynamics* (Santa Monica, CA: RAND, 2010), p. 92.

[58] Ibid., p. 96.

[59] Wehrey, et. al, *Dangerous but Not Omnipotent*, p. 11.

self-image and the aspirations of the regime, and the reality of Iran's military weakness."[60] Acquiring nuclear weapons would certainly help to close that gap; not only would Iran become the dominant military power in the Persian Gulf region, it would also become one of only a handful of nations with a nuclear-weapons capability, a status it would certainly call attention to and attempt to exploit. Nuclear weapons could also move Iran closer to its objective of seizing the leadership of Islam from the Sunni Arab regimes, particularly those in Riyadh and Cairo. Tehran has long sought to exploit the Arab nations' failure to successfully confront Israel or resolve the Israeli-Palestinian conflict. Acquiring nuclear weapons would further differentiate Iran from these nations, and would enable it to both emphasize Arab weakness and champion the Palestinian cause even more vociferously (and perhaps aggressively) than it has to date, increasing its own standing in the Muslim world.

Religious Ideology

Not all possible motives for the pursuit of nuclear weapons fall neatly into the three categories described above. For example, one of the most significant questions surrounding Iran's nuclear program is the extent to which it is driven by millenarian considerations. Specifically, the vast majority of the Iranian population adheres to the "twelver" branch of Shia Islam. In general, twelvers believe that the twelfth imam, the last in a line of successors to and decedents of the Prophet Muhammad, "did not die but went into hiding or 'occultation' in 874 C.E. and that he will return in 'the last days' as the Mahdi to establish the reign of justice and equity on earth."[61] Although many religious traditions include similar predictions of a violent "end of days," Iranian President Mahmoud Ahmadinejad has made numerous statements that suggest he devoutly believes this aspect of Shia theology.[62] In a speech to the United Nations, for instance, Ahmadinejad concluded with an appeal to God to "hasten the emergence of your last repository, the Promised One [i.e., the Twelfth Imam], that perfect and pure human being, the one that will fill this world with justice and peace."[63] Based on this and similar proclamations, there has been speculation that Ahmadinejad and his supports might even seek nuclear weapons to trigger a major conflagration and hasten the return of the Mahdi.[64]

Of course, it is impossible to judge whether Iranian leaders like Ahmadinejad are sincere in their rhetoric, or to predict how their beliefs will influence their behavior. Nevertheless, there are several reasons to be skeptical that millenarian beliefs are a driving factor behind Iran's pursuit of nuclear weapons. First, Iran's nuclear program originated during the Shah's rule and, after collapsing in the wake of the Iranian Revolution, was restarted during the Iran-Iraq war in response to Baghdad's use of chemical weapons. In short, Iran's nuclear aspirations long

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[60] Michael Eisenstadt, "Living with a Nuclear Iran?" *Survival*, Autumn 1999, p. 126.

[61] International Crisis Group, "Understanding Islamism," Middle East/North Africa no. 37, March 2, 2005, p. 19.

[62] Marc Perelman, "U.S. Studies Iranian's Religious Ideology," *Forward*, March 3, 2006.

[63] Quoted in Anton La Guardia, "'Divine Mission' Driving Iran's New Leader," *Daily Telegraph*, January 14, 2006.

[64] See, for example, Charles Krauthammer, "In Iran, Arming for Armageddon," *Washington Post*, December 16, 2005; and Yaakov Lapin, "Awaiting the Iranian Messiah," *Ynet News*, November 12, 2006; and

predated the nation's current leadership, and were previously motivated by prestige and security concerns rather than religious considerations. Second, if Iran was truly a "suicidal" nation that hoped to instigate a major war with no real interest in winning (at least not in this world), it would be the first such nation in history. Third, Iran's domestic political system strictly limits the power and influence of the presidency. Ahmadinejad, therefore, "has little authority in matters of defense. The Supreme Leader, Ayatollah 'Ali Khamenei, wields ultimate authority, and, as commander-in-chief of the armed forces, his weight on security matters is second to none."[65]

At the same time, however, it does appear that a shift has occurred since 2005, with hardliners (some of whom may have deeply held millenarian beliefs) gaining influence at the expense of relative moderates (who may still support Iran's nuclear program, but likely do so for more traditional strategic and nationalistic reasons). Moreover, while the precise relationship between Khamenei and Ahmadinejad is unclear, the Supreme Leader seems to have sided firmly with the president rather than his critics on the nuclear issue, although this may be due in part to his view that Ahmadinejad and his supporters are more loyal than their domestic political opponents.[66] Finally, it appears that there are elements within the IRGC in particular that have apocalyptic views, and that these elements are generally supportive of Ahmadinejad. Both the prevalence of these beliefs and the influence of these groups are unclear.[67]

What is clear is that these questions will only exacerbate uncertainty over Iran's intentions and complicate any efforts to contain a nuclear-armed Iran. To the extent that there are competing centers of power within the regime, including a Supreme Leader that plays different factions off one another to maintain his own position, crafting an effective strategy of containment and deterrence—which requires at least some understanding of who is in charge and how an adversary calculates costs and benefits—will not be easy. In addition, even if religious beliefs are not a major factor behind Iran's pursuit of nuclear weapons, they could still play a significant role, potentially influencing how Iran behaves once it acquires them. Although ideologically motivated leaders may not be in charge of the nuclear program or have the final say regarding the employment of nuclear weapons, they could still be in a position to influence actions that have the potential to trigger a crisis. It is not difficult to imagine, for example, a high-level official ordering a lower-level IRGC commander to have naval units harass American vessels in the Persian Gulf in the hope of provoking a confrontation, which could escalate out of control.

The more serious question, however, is how senior Iranian leaders are likely to behave during a crisis, and whether they will be far more risk acceptant than the opponents the United States has faced in the past or confronts elsewhere today. Unlike the aging and atheistic leadership of the Soviet Union, which apparently recoiled at the prospect of nuclear war, or the current generation of leaders in Beijing, who rely on continued economic growth to legitimize their rule, more

[65] Wehrey, et. al, *Dangerous but Not Omnipotent*, p. 43.

[66] Thaler, et. al, *Mullahs, Guard, and* Bonyads, pp. 102-107.

[67] Mehdi Khalaji, "Apocalyptic Visions and Iran's Security Policy," in Patrick Clawson and Michael Eisenstadt, eds., *Deterring the Ayatollahs: Complications in Applying Cold War Strategy to Iran* (Washington, DC: Washington Institute for Near East Policy, 2007), p. 31.

zealous leaders in Iran may be willing to engage in high-stakes brinkmanship and threaten—or perhaps even use—nuclear weapons during a crisis. According to some analysts and pundits, these concerns are overstated. Fareed Zakaria, for example, merely echoed a widely held view that deterring any nuclear-armed opponent is a relatively easy task when he recently argued that "deterrence worked with madmen like Mao, and with thugs like Stalin, and it will work with the calculating autocrats of Tehran."[68] As Scott Sagan has cautioned, however, this type of retrospective oversimplification contributes to a sense of "deterrence optimism" that not only oversimplifies the past, but also draws historical parallels with today's challenges that may not be warranted: "Although deterrence did work with the Soviet Union and China, there were many close calls; maintaining nuclear peace during the Cold War was far more difficult and uncertain than U.S. officials and the American public seem to remember today."[69] Given the complex motives influencing Iran's apparent pursuit of nuclear weapons, as well as the broader regional dynamics that could contribute to instability, the assumption that deterring and containing a nuclear-armed Iran will be relatively easy tasks does not withstanding scrutiny.

IRAN'S FUTURE NUCLEAR POSTURE AND FORCES

Projections regarding Iran's future nuclear posture and the specific characteristics of any arsenal it deploys are almost certain to be flawed in some respects. Nevertheless, it is still valuable to review the options that it may have and the dilemmas it could confront, particularly in light of what (admittedly limited) information is known about the regime, its leaders, and their motives, as well as the general strategic considerations that other nations in a similar position would confront.

A Latent, Virtual, or Declared Nuclear Capability?

In general, Iran appears to have three paths that it could follow as it determines what type of nuclear-weapons capability to pursue. First, it could limit itself to a "latent" nuclear capability similar to that possessed by Japan, or what is sometimes referred to as a strategy of "nuclear hedging." This approach would involve "maintaining, or at least appearing to maintain, a viable option for the relatively rapid acquisition of nuclear weapons, based on an indigenous technical capacity to produce them within a relatively short time frame ranging from several weeks to a few years." Specifically, a robust latent capability would necessitate "fuel-cycle facilities capable of producing fissionable materials…as well as the scientific and engineering expertise to support them and to package their final product into a nuclear explosive charge."[70] In this case, therefore, Iran would forgo weaponizing its nuclear material in the hope that a latent capability would be sufficient to deter any potential attacker, but not threatening enough to provoke a crippling international backlash. A second option could find Iran adopting a "virtual" nuclear posture similar to the Israeli model. Here, Iran would proceed with weaponization and deploy a nuclear arsenal (although its weapons and delivery systems would not necessarily have to be co-located),

[68] Fareed Zakaria, "Containing a Nuclear Iran," *Newsweek*, October 3, 2009.

[69] Scott D. Sagan, "How to Keep the Bomb From Iran," *Foreign Affairs*, September/October 2006, p. 46.

[70] Ariel E. Levite, "Never Say Never Again: Nuclear Reversal Revisited," *International Security*, Winter 2002/03, p. 69. See also Reiss, "The Nuclear Tipping Point," p. 4

but would not conduct a nuclear test (at least not on its own territory) or openly acknowledge this capability.[71] A final option would simply be for Iran to test a nuclear weapon, develop and deploy a nuclear arsenal, and publicly advertise its new military capability.

As it debates these different courses of action, the Iranian leadership will likely weigh a number of considerations. For example, a latent or virtual nuclear capability could enable Iran to reap significant benefits (most importantly deterring an attack by Israel or the United States) with relatively little risk. Until it becomes unequivocally clear that Iran is pursuing nuclear weapons, which is unlikely barring an Iranian declaration to this effect or a decision by the regime to test a nuclear device, it appears that the international community will not take the necessary steps to rollback Iran's nuclear program (either through military force or sanctions on the regime's energy exports and refined petroleum imports). At the same time, however, once it is apparent that Iran has some capacity to build or deploy nuclear weapons, it is also unlikely that any outside power will run the risk of a military strike against its known nuclear facilities. Thus, as Peter Feaver has explained, "An opaque proliferator can continue to develop nuclear weapons without incurring world opprobrium as de jure violator of the nuclear nonproliferation regime. Moreover, if the opacity lifts enough to persuade potential enemies that the weapons' program is real, then the opaque proliferator can enjoy the deterrent benefits of possession at minimal cost."[72] In short, Tehran can exploit the ambiguity surrounding its nuclear capability to diffuse serious international opposition and discourage a military attack (or a more robust economic sanctions regime), while steadily accumulating fissile material, building up its nuclear infrastructure, and perhaps even developing and deploying nuclear weapons and delivery systems. In addition, a latent or virtual posture would also have the important benefit of reducing pressure on other states in the region to pursue their own nuclear programs.

Latent and virtual arsenals do have drawbacks, however, particularly given Iran's apparent objectives. For instance, a latent capability in particular may not be considered an adequate deterrent to a preventive military strike, and many not be considered an effective coercive capability that would enable Iran to gain greater leverage over its neighbors in the region. An ambiguous nuclear posture could also increase the prospects of miscalculation and even war. If the Middle East is populated by two nuclear powers (Iran and Israel), neither of which has declared the existence of its arsenal, the size of that arsenal, or its potential delivery systems, the prospect that one side might misjudge the other's willingness and ability to retaliate in certain circumstances is likely higher than it would otherwise be. Moreover, a latent or virtual nuclear capability may not deliver the international and domestic prestige associated with nuclear

[71] Avner Cohen and Benjamin Frankel, "Opaque Nuclear Proliferation," *Journal of Strategic Studies*, September 1990, pp. 21-23. If necessary, Iran could perhaps test a weapon, but deny that it had occurred, or test a weapon in another state, for example North Korea. Alternatively, if Iran's weapons are based on existing Chinese or Pakistani designs, that testing may not be required to guarantee their reliability. Finally, if Iran was willing to settle for several large, primitive, gun-type nuclear weapons, the relative simplicity of this design could also obviate the need for testing; the United States, for example, was confident enough in its first gun-type weapon to forgo testing entirely and use it against Hiroshima in 1945.

[72] Peter D. Feaver, "Proliferation Optimism and Theories of Nuclear Operations," *Security Studies*, Spring/Summer 1993, p. 175.

weapons. As political and economic instability within Iran continues to grow, the regime's leaders may be tempted to test a nuclear device and build a nuclear arsenal in the hope that the public will rally around these symbols of Iranian independence and defiance of the West. Factionalism could also push Iran toward a declared nuclear arsenal, as more radical clerics or hard-line members of the IRGC might pressure the government into adopting this approach.[73] Finally, Tehran simply may view the consequences of declaring its nuclear arsenal as negligible. According to one analysis, "Many influential conservative voices insist that Iran's breakout would follow the model of India and Pakistan, with the initial international outcry soon followed by an acceptance of Iran's status."[74] This is hardly surprising; although the United States and EU-3 have repeatedly declared they will not tolerate Iran's progress toward a nuclear capability, they have yet to back their threats with strong military or economic actions. If during the early Cold War the West's political leaders had to learn to "think the unthinkable," they now seem willing to "accept the unacceptable."

Of course, it is impossible to know for certain how Iran plans to proceed; indeed, the Iranian leadership itself may not yet know what it will do in the future. Nevertheless, the preceding considerations strongly suggest that Iran will *eventually* become a declared nuclear power absent outside intervention to prevent this outcome. If so, then it is very likely Iran will adopt a "breakout" strategy, whether by default or by design, in which it moves sequentially from a latent capability, to a virtual capability, to a declared capability. The underlying goal of this approach would be to move relatively quickly to a declared capability (to reap the potential military, economic, and diplomatic benefits), but not until Iran could deploy a sizeable nuclear force (to minimize the prospect of a preventive attack by Israel or the United States). Prior to its actual declaration, Iran would likely advance its nuclear efforts along four main lines: the accumulation of fissile material, warhead design, delivery systems development, and an assessment of survivability options. Specifically, Iran would continue to amass LEU in its known facilities and, more importantly, HEU in any clandestine facilities it has constructed.[75] It would also engage in clandestine warhead design and testing to create weapons small and durable enough to be employed on ballistic missiles, which appear to be its delivery system of choice and which it would also continue to produce, and would perhaps begin to deploy small numbers of weapons in secret. Throughout this process Iran could follow the "North Korean model" of negotiating with the international community to extort benefits or reduce tensions, effectively "running down the clock" while simultaneously moving toward its breakout capability. By

[73] Eisenstadt, "Living with a Nuclear Iran?" p. 131.

[74] Dueck and Takeyh, "Iran's Nuclear Challenge," p. 197.

[75] The presence of clandestine facilities would be crucial for an effective breakout strategy, because it would allow Iran to accumulate HEU and develop nuclear weapons in secret. By contrast, if Iran were forced to rely on conversion and enrichment facilities currently under IAEA safeguards, then a window of opportunity for a military attack might arise in the period between removal of those safeguards, diversion of LEU stocks to secret enrichment sites or modification of existing enrichment facilities to produce HEU, and the development and deployment of nuclear weapons. Iran could also begin to develop small stockpiles of plutonium, although doing so in any meaningful way would require the removal of spent fuel from its still-incomplete heavy water power reactor at Arak, which would in turn require the removal of IAEA safeguards on that facility, providing a window of opportunity for a military strike.

pursuing this approach over the course of several years, Iran could develop an arsenal of several or a dozen weapons, and perhaps more, by the time it announced its status as a nuclear power.

Creating a Survivable Nuclear Arsenal

If Iran develops a small or medium sized nuclear arsenal, one of its most important goals will be to ensure the survivability of that arsenal against a preventive or preemptive attack. To do so, there are several possibilities that Tehran might pursue. For example, Iran appears to favor ballistic missiles as its principal delivery vehicle for the WMD it already possesses and any future nuclear weapons it deploys. This offers several benefits; in particular, ballistic missiles are relatively easy to launch and hard to defend against, creating a high probability that Tehran could strike foreign targets in the aftermath of an attack. Moreover, transporter-elector-launchers (TELs) are extremely difficult to locate, track, and destroy before (and even after) they launch their payload, a problem that would be magnified for the United States or Israel if Iran exploited its complex terrain and strategic depth by dispersing its TELs throughout the country.[76] Perhaps most importantly, Iran could build on these advantages by deploying a far greater number of missiles, missile launchers, and decoys relative to the number of warheads it actually builds. This would present any prospective attacker with a "shell game" dilemma; because it would not be clear which launchers were real and which missiles were armed with a nuclear warhead, the target set would expand dramatically while the prospects of destroying all nuclear weapons would correspondingly diminish. This strategy would also be consistent with Iran's approach to deterrence, which depends upon "exaggeration, ambiguity, and obfuscation about its ability to exact a prohibitive cost from potential aggressor."[77]

Two alternative possibilities that Iran could pursue are burying its nuclear force or putting part of that force out to sea. For instance, if Iran's leaders did not anticipate the need for a prompt retaliatory capability, they could choose to store some or all of their nuclear warheads in caves or deep underground facilities, which could secure them against any external attack short of an assault with nuclear weapons. Iran could also place several of its weapons on transport ships or other vessels, enabling them to hide amid the clutter of commercial shipping. This option might not be feasible, however, until Iran's weapons designers can produce a warhead capable of being mated with a cruise missile, a possibility that will become more realistic if and when Iran is capable of producing plutonium that can be used in smaller weapons. If Iran's weapons program does advance to this level, Tehran might also consider deploying nuclear-armed cruise missiles abroad its Russian-built Kilo-class submarines to create a small undersea deterrent capability.

A very different possibility would involve Tehran leveraging its alliances with both state and perhaps non-state actors. For example, Iran could deploy nuclear weapons abroad in nations like Syria, or perhaps in Hezbollah-controlled parts of Lebanon. Interestingly, there are reports that the Pakistani military considered transferring part of Pakistan's nuclear arsenal to Afghanistan during the Kargil conflict to protect it against an attack by India, and even contacted the Taliban

[76] On the difficulties associated with destroying time-sensitive-targets such as TELs, see Barry D. Watts, *The Case for Long-Range Strike: 21st Century Scenarios* (Washington, DC: Center for Strategic and Budgetary Assessments, 2008), pp. 25-27.

[77] Wehrey, et. al, *Dangerous but Not Omnipotent*, p. 41.

to discuss the possibility.[78] In all likelihood, if Iran pursued a similar option it would keep its weapons under the control of the IRGC's Quds Force.[79] This would, however, force any would-be attacker to strike several nations in addition to Iran if it hoped to eliminate its nuclear capability. Finally, Iran could also seek to cooperate with other "rogue" nations (for example North Korea and Venezuela) with the goal of creating an anti-American axis of minor nuclear-armed powers that could each pose a threat of direct retaliation against the United States or its allies.

The Relationship Between Arsenal Size, C2, and Security

In sizing any future nuclear arsenal, and in planning their country's longer-term nuclear posture, Iranian leaders will not only want to guarantee that their weapons are survivable, they will also want to ensure that they can be reliably controlled by the central leadership. These considerations interact with one another, and produce what has been called the always/never dilemma: "Leaders want a high assurance that the weapons will always work when directed and a similar assurance the weapons will never be used in the absence of authorized direction."[80] The main threat to the former is a decapitating strike that destroys a nation's nuclear weapons or delivery vehicles, or undermines its command-and-control systems (C2). The principal threats to the latter are permissive command-and-control systems and inadequate security measures that open the door to theft, accidental use, or unauthorized use. Of course, efforts to address one of these issues often exacerbate the other, which applies not only to specific C2 arrangements, but also to arsenal size.[81] All things being equal, a very small arsenal is easier to safeguard against theft, unauthorized use, or other internal threats. At the same time, a small arsenal may be more vulnerable to a preemptive or preventive attack, particularly if a nation relies on deception and concealment for survivability, which could be compromised by a single intelligence failure.[82] While increasing the size of that arsenal might enhance survivability in the face of a first strike, it would also introduce a heightened possibility of unauthorized use.

Unfortunately, it is impossible to predict how Iranian leaders will respond to these issues. Perhaps the only observation that can be made with any certainty is that Iran will confront the

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[78] Sagan, "How to Keep the Bomb From Iran," p. 52.

[79] The Quds (Jerusalem) Force is the IRGC branch response for overseas activities, including intelligence collection, unconventional warfare, and terrorist activities. Cordesman and Seitz, *Iranian Weapons of Mass Destruction*, pp. 76-79.

[80] Peter D. Feaver, "Command and Control in Emerging Nuclear Nations," *International Security*, Winter 1992/93, p. 163.

[81] For example, delegating launch authority to lower-level military commands increases the ability to retaliate but heightens risks of unauthorized use, while maintaining centralized control has the opposite effects. Ibid., pp. 164-170.

[82] How a state weighs the severity of internal versus external threats is also a critical factor. For example, if the latter are viewed as more serious, then small nuclear arsenals may be complemented by delegative command-and-control arrangements that increase the likelihood of being able to launch a retaliatory strike, but which also increase the risk of unauthorized use. See Feaver, "Proliferation Optimism and Theories of Nuclear Operations," p. 167.

same dilemmas that all emerging nuclear powers have faced; how nations such as China, India, Pakistan, and South Africa addressed these issues, and what lessons can be drawn for the Iranian case, is therefore a topic that merits further research. Nevertheless, several specific points should be mentioned. First, the more survivability options a state pursues (e.g., mobile missile, deep underground repositories, seaborne forces, deployments outside of the country, etc.), the larger its arsenal will grow, and the more complex its C2 arrangements are likely to be. Second, if Iran's nuclear program does drive other nations in the region to pursue nuclear weapons in response, then Tehran may build a larger arsenal to retain a quantitative advantage over its rivals. Third, Iran's civil-military relations are extremely complex; Iran has a divided military establishment that is intended in part to reduce the probability of coups, yet one of those military organizations—the IRGC—is deeply and increasingly involved in domestic politics. Although these patterns are almost certain to influence both the size of any future Iranian nuclear arsenal and how those weapons are controlled, it is unclear precisely how.

Fourth, it is also unclear what Iran's predispositions might be, or what unique cultural and political factors might influence its position on these issues. The scale of the Natanz uranium enrichment facility, for instance, suggests that Iran does hope to produce a large number of weapons: the facility, which was apparently intended to be clandestine, has a capacity of approximately 50,000-centrifuges. At the same, there appears to be a disconnect between Iran's objectives and its capabilities in other areas, notably its conventional military forces, which remain relatively small despite Iran's aspiration to be a significant military power. It is possible that this pattern may influence Iran's pursuit of nuclear weapons and lead it to develop a relatively small arsenal. Finally, if some of Iran's leaders are truly driven by religious, millenarian aims, then it is possible that they may view nuclear weapons not as tools of deterrence or coercion, but rather as weapons to be used against their enemies. If so, then considerations such as survivability may count for little. Instead, what is likely to matter is that the regime has enough weapons to successfully employ them against its opponents, in all likelihood Israel.

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III. THE ISRAELI-IRANIAN NUCLEAR BALANCE

Although the implications of a nuclear-armed Iran would be felt throughout the region and beyond, the most immediate and most serious impact would be on Israel, whose leaders have repeatedly stated that an Iranian nuclear-weapons capability represents an existential threat to their state.[83] Assuming that neither Israel nor the United States conducts a military attack before Iran crosses the nuclear threshold, Israel will be forced to address three key issues: whether to launch a preventive attack *after* Iran acquires some type of nuclear-weapons capability; whether to retain, abandon, or modify its posture of nuclear ambiguity; and how to adapt its nuclear arsenal and doctrine to a newly-bipolar region.[84]

TO STRIKE OR NOT TO STRIKE

The first major decision Israeli leaders would face in the wake of an Iranian nuclear-weapons capability is whether or not to launch a military attack to destroy that capability before it grows larger and more robust, or before Iran can use its weapons against Israel. This is not a trivial possibility. Not only does Israel consider a nuclear-armed Iran a direct and existential *military* threat, it also poses a more subtle and longer-term danger. Namely, by providing increased support to groups like Hamas and Hezbollah, and simply by holding out the possibility of using its nuclear weapons during a crisis, Iran could have a very serious and detrimental impact on the morale of an already-beleaguered Israeli society, contributing to a siege mentality and triggering a significant increase in emigration.[85] At the same time, Israeli strategic culture also emphasizes preemptive and preventive action, for example at the start of the 1956 Suez War and the 1967 Six Day War, as well as the Israeli Air Force's two attacks against nuclear facilities (the 1981 strike against Osirak in Iraq and the 2007 strike against al Kibar in Syria).

These considerations aside, how Israel will respond to a nuclear-capable or nuclear-armed Iran will depend heavily on the size and character of Iran's nuclear-weapons program. For example, if Iran clearly crosses the nuclear threshold yet has only a latent capability (i.e., enough fissile material for several nuclear weapons or the capacity to produce it quickly, and the ability to weaponize that material and perhaps mate nuclear warheads to ballistic missiles) then Israeli leaders may be willing to accept the risks of an attack. This would also presume, however, that the Israeli military is capable of locating and destroying most of that material, as well as any

[83] Several high-ranking American officials, including Chairmen of the Joint Chiefs of Staff Admiral Mike Mullen, have publicly agreed with this perspective. Amir Omen, "U.S. Top Brass: Iran is Existential Threat to Israel," *Haaretz*, November 8, 2009.

[84] The issue of launching a preventive attack *before* Iran becomes a nuclear power is a far more likely possibility and a critical issue facing policymakers in both Israel and the United States. In all likelihood, Israel's goal in any attack would not be to destroy the Iranian nuclear program but rather to set it back for several years, thus buying additional time for diplomacy or economic sanctions to have a significant effect, or for the regime in Tehran to be removed internally. A detailed assessment of the pros and cons of this option are outside the scope of this report, however.

[85] John Mueller and Ian S. Lustick, "Israel's Fight-or-Flight Response," *The National Interest*, November/December 2008.

clandestine uranium enrichment facilities. If, on the other hand, Tehran does achieve a true "breakout" capability and has an arsenal large and secure enough to constitute an effective minimal deterrent, than the probability of a *preventive* military action is very close to zero. The probability of a *preemptive* attack under these circumstances could be significantly higher, however, if Israel believed that an Iranian nuclear attack was imminent and calculated that it was possible to reduce the effectiveness of that attack by launching a conventional or even nuclear first strike.

Perhaps the most dangerous situation would arise if Iran's nuclear program fell into the "gray area" in between latent capability and effective deterrent; that is, if it were revealed that Iran had an extremely small arsenal of only several weapons. Depending on a number of factors (including the estimated size of the arsenal, the delivery systems Iran planned to use, whether fissile cores were stored separately from the rest of the warheads, whether the warheads themselves were co-located with delivery systems, and the specific command-and-control arrangements, among others), the possibility exists that the Iranian arsenal could be highly vulnerable. If so, this would provide Iran with a strong incentive to "use them or lose them" and launch an attack before the United States or Israeli could destroy its arsenal, which would in turn give Israel a strong incentive to preempt and strike first.[86] This would, therefore, be a classic example of Thomas Schelling's "reciprocal fear of surprise attack," creating a highly unstable and extremely dangerous strategic environment.[87]

Despite the extraordinarily high costs and risks, there are scenarios in which Israel might be willing to conduct a military attack even after Iran crosses the nuclear threshold. Nevertheless, several considerations still lead to the conclusion that this possibility is highly unlikely, except if a situation arises in which Iran's arsenal is both small and extremely vulnerable, or if Israel concludes that a premeditated nuclear attack is highly likely. First, the military challenges associated with destroying or dealing a major blow to a nuclear program that is highly dispersed and protected by passive and active defenses (e.g., deeply buried facilities and surface-to-air missile systems, respectively) are numerous. According to one report, for example, Israeli Defense Minister Ehud Barak recently told several members of the Knesset in a closed meeting that the Iranian enrichment facility at Qom "cannot be destroyed through a conventional attack."[88] Second, even with a robust indigenous ballistic missile defense (BMD) system supplemented with American BMD assets (if the latter were available), there is a strong likelihood that one or several missiles would "leak" through this defensive screen—missiles that could be armed with nuclear warheads. Moreover, these defense systems would not guard against unconventional methods of delivery. Third, and most importantly, Israel's small geographic size means that it is unlikely to withstand a nuclear attack and remain a viable society and nation; although it may not be a "one bomb country" that can be destroyed by a single crude

[86] Feaver, "Proliferation Optimism and Theories of Nuclear Operations," p. 166.

[87] Thomas C. Schelling, *The Strategy of Conflict* (Cambridge, Mass: Harvard University Press, 1960), chapter 9.

[88] Quoted in "The Gathering Storm," *The Economist*, January 7, 2010.

fission weapon detonating in or above one of its major cities, it is difficult to imagine that Israel can survive much more—if that.

NUCLEAR AMBIGUITY

If Israel does have to live with a nuclear-armed Iran, one of the first issues it is likely to address is the status of its nuclear program and whether to announce it to the world. Although Israel has long been suspected of having a robust nuclear arsenal, it has consistently adopted a posture of nuclear ambiguity, neither confirming nor denying its nuclear capability, but maintaining that it will not be the first nation to "introduce" nuclear weapons into the region.[89] Iran's progress toward a nuclear weapons capability has, however, triggered a debate over whether Israel should openly declare its nuclear arsenal to strengthen deterrence vis-à-vis Tehran.[90] Nevertheless, it seems likely that Israel will opt to preserve its nuclear ambiguity, even in the face of a nuclear-armed Iran, for several reasons.

First, ending ambiguity could encourage Arab nations and Turkey to pursue their own nuclear weapons programs in the future. Although these nations have thus far been able to live with Israel's nuclear program (despite their repeated complaints that American opposition to nuclear proliferation and its acquiescence to Israeli nuclear weapons constitutes a double standard), the combination of a nuclear-armed Iran and an openly nuclear-armed Israel may alter their calculations, due to security considerations, domestic political pressure, or both.[91] Second, ending ambiguity could also undermine the prospects for increased cooperation between Israel and its neighbors in dealing with the threat posed by Iran, a threat they all share. Third, security cooperation with the United States might be jeopardized as well. In the wake of an Israeli declaration, there would almost certainly be renewed calls in the region and beyond for Israel to submit its unsafeguarded nuclear facilities to IAEA inspections, or to engage in serious negotiations toward a nuclear- or weapons of mass destruction-free zone in the Middle East. Assuming that Israel refused, Washington could find it challenging to maintain the same level of support for Israel while balancing the demands of its other allies in the region—allies that may find it extremely difficult to cooperate with the United States under these circumstances, and could use the threat of accommodating Iran or pursuing their own nuclear weapons programs as leverage.

Finally, against all of these downsides there appear to be few tangible benefits to becoming a declared nuclear power, simply because the world already believes that Israel is one.[92] Israel

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[89] Nuclear Threat Initiative, Israeli Nuclear Program Overview, available at http://www nti.org/e_research/profiles/Israel/Nuclear/index html.

[90] Joshua Mitnick, "Why Israel Maintains Nuclear Ambiguity," *Christian Science Monitor*, December 14, 2006; and Dan Williams, "Israel Sees No Pressure on Nuclear Ambiguity Policy," *Reuters*, February 4, 2009.

[91] Notably, one of the principal benefits of Israeli nuclear ambiguity is that provides a deterrent without encouraging other nations in the region to pursue their own nuclear programs. Cohen and Frankel, "Opaque Nuclear Proliferation," p. 26.

[92] Chuck Freilich, "The United States, Israel, and Iran: Defusing an 'Existential' Threat," *Arms Control Today*, November 2008.

could, however, use the possibility of abandoning nuclear ambiguity—and the prospect that this could trigger further proliferation in the region—as a means to gain increased support from the United States. Specifically, Israel could seek US assistance to bolster the capabilities and responsiveness of its nuclear arsenal (discussed below), or perhaps to gain a formal security commitment.

ISRAEL'S NUCLEAR ARSENAL

Reliable and accurate information regarding Israel's nuclear arsenal is difficult to obtain given its highly secretive status. Nevertheless, credible reports generally estimate that Israel possesses enough weapons-grade plutonium for 100-200 nuclear warheads, and possibly more. In terms of delivery systems, it also appears to have deployed a "triad" that includes tactical fighters (specifically its F-16Is), ballistic missiles (most importantly its Jericho II missiles, which have an estimated range of approximately 1,500 kilometers, and possibly a follow-on Jericho IIB with a 2,800 kilometer range), and three diesel-electric submarines (which are believed to be equipped with nuclear-armed cruise missiles).[93] A key question, however, is how Israel might seek to adapt this force following the emergence of a nuclear-armed Iran. If Israel does attempt to bolster its nuclear capabilities, and reports indicate that Israeli leaders are already considering steps in this direction, it will likely be guided by three considerations: enhancing the survivability of its arsenal, the lethality of its weapons, and the responsiveness of its delivery systems.

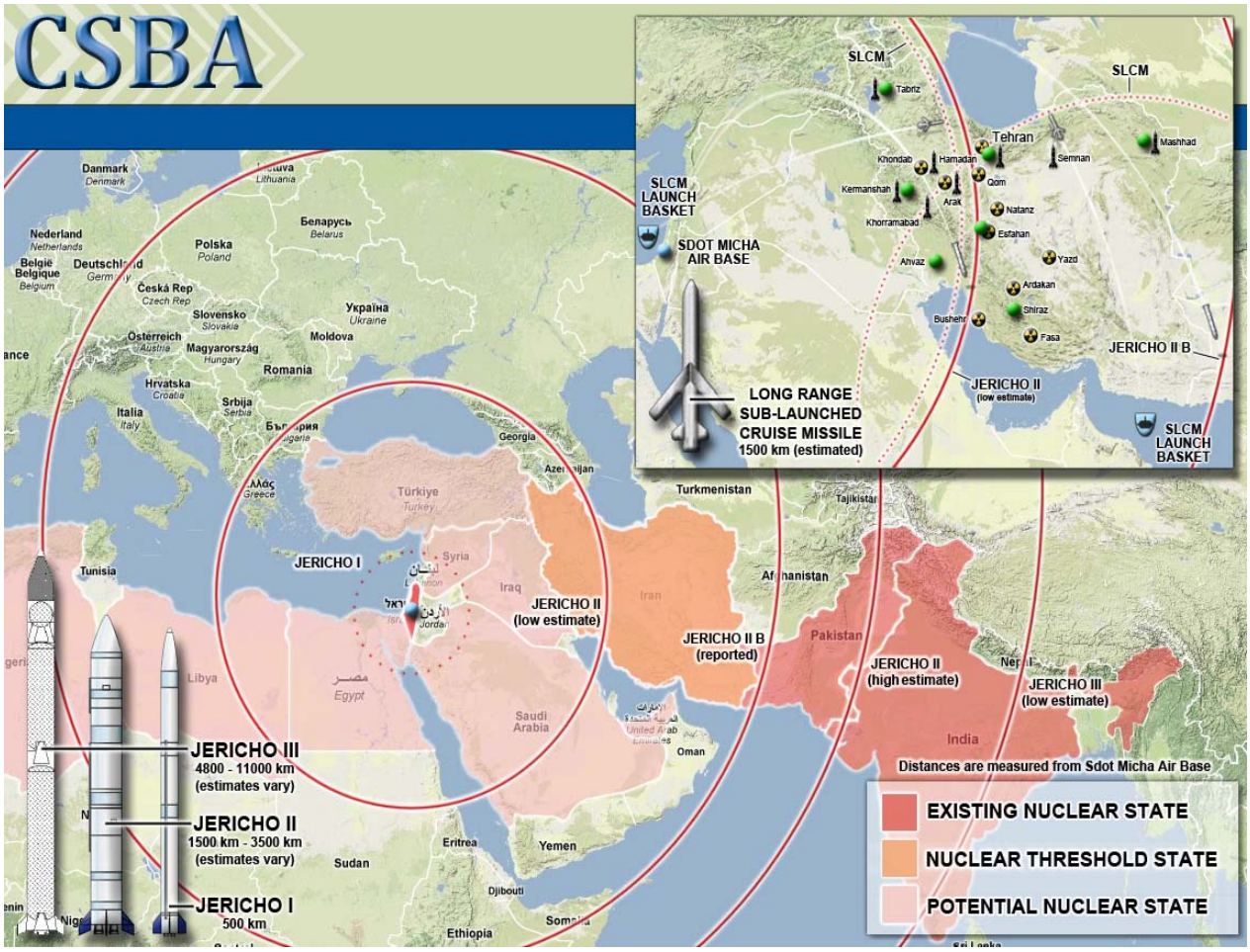
Despite its relatively large nuclear arsenal and the widely-held assumption that Israel already possesses a secure, second-strike capability, survivability is likely to be a core concern for Israeli leaders given their county's small size and limited strategic depth, as well as the extremely short intra-regional ballistic missile flight times which create the possibility of being attacked with little warning. In response to these considerations, Israel could put its nuclear forces on heightened alert, for example "strip" or "airborne" alert status for its nuclear-capable fighters. Yet doing so would be economically costly (especially if Israel sought longer-range and longer-endurance aerial platforms) and potentially dangerous (if a plane in flight were to crash or be shot down). It is also unclear how much effort and money Israel would want to invest in aerial-delivery platforms, particularly if Iran is finally able to acquire S-300PMU1 (SA-10) surface-to-air missile systems from Moscow, and perhaps even more advanced systems in the future, which could significantly degrade the Israeli Air Force's ability to conduct attacks against Iran's nuclear facilities and other key targets.[94] At the same time, Israel's ballistic missile force is

[93] Stockholm International Peace Research Institute, *SIPRI Yearbook 2008: Armaments, Disarmaments, and International Security* (New York: Oxford University Press, 2008), pp. 396-397; Natural Resource Defense Council, "Nuclear Notebook: Israel Nuclear Forces, 2002," *Bulletin of the Atomic Scientists*, September/October 2002, pp. 73-75; Center for Defense Information, "Israeli Nuclear Arsenal," August 6, 2008, available at http://www.cdi.org/friendlyversion/printversion.cfm?documentID=2965&from_page=../program/document.cfm; Nuclear Threat Initiative, "Israel Prolife: Missile Overview," updated November 2008, available at http://www nti.org/e_research/profiles/Israel/Missile/index html; and Seth W. Carus, "Israeli Ballistic Missile Developments," unclassified working paper, no date, appendix to the final report of the Commission to Assess the Ballistic Missile Threat to the United States, available at http://www fas.org/irp/threat/missile/rumsfeld/pt2_carus2.htm. Israel also has shorter-range ballistic missiles, the Jericho I, although these may have been withdrawn from service during the 1990s. There have also been reports that it is developing an intercontinental ballistic missile, the Jericho III, but these remain unconfirmed.

[94] Pavel Felgenhauer, "Tehran on the Brink of Procuring S-300 Missiles," *Eurasia Daily Monitor*, October 22, 2009.

believed to be located on TELs inside caves, and while concerns have been raised regarding their ability to withstand a nuclear attack, it is unclear what steps Israel may have already taken or could take to address this possible concern.[95]

Figure Three: Israel Ballistic and Cruise Missile Ranges



Due to these considerations, it would not be surprising if Israel placed an increased emphasis on undersea platforms, particularly given their inherent survivability and Israel's open access to the Mediterranean Sea. According to recent reports, Israeli Prime Minister Benjamin Netanyahu has already expressed an interest in expanding Israel's submarine fleet in response to the threat posed by Iran, with one anonymous source claiming that Israel would ultimately like to acquire nine submarines.[96] Pursuing a larger submarine fleet does raise several potential challenges, however.

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[95] Nuclear Threat Initiative, "Israel Profile: Israel Missile Facilities," available at http://www nti.org/e_research/profiles/israel/missile/3568_3715 html; and Harold Hough, "Could Israel's Nuclear Assets Survive a First Strike," *Jane's Intelligence Review*, September 1997, pp. 407-410.

[96] Dan Williams and Brian Rohan, "Israel in Talks to Buy 6th Submarine from Germany," *Reuters*, January 14, 2010. Israel currently has three *Dolphin*-class submarines, with two more purchased and under construction.

First, the cost of doing so is likely to be substantial. Israel's first two *Dolphin*-class submarines were donated by Germany, while the cost of the next three was divided between the Israeli and German governments, an arrangement that might be difficult for Germany to sustain but equally hard for the Israelis to forsake.[97] Second, Israel's submarines are currently based at Haifa on the Mediterranean coast. If Israel wanted to conduct patrols or launch attacks from the Arabian Sea or Gulf of Oman, which would enable its submarines to strike a wider set of targets within Iran, its submarines would have to pass through the Suez Canal (access to which could be restricted by Egypt at some point in the future), go around the African continent (which may exceed the limited endurance of conventionally-powered submarines or allow for extremely limited time on station), or Israel would have to build a second naval facility at Eilat in the Gulf of Aqaba. Although the final option could make sense in principal, the Israelis are unlikely to have the means to pursue it. As one Israeli naval official recently argued, "the navy cannot take on the logistical burden of setting up two bases, with all the specialised needs in terms of equipment, maintenance crews and security safeguards, for a submarine fleet that, at most, will comprise five Dolphins."[98]

A final issue centers on the armaments of these submarines. Although it is widely believed that Israeli submarines carry nuclear-armed missiles, possibly including a variant of the short-range US Harpoon anti-ship missile, it remains unknown whether Israel has developed nuclear-armed cruise missiles with sufficient range to strike targets within Iran.[99] There is speculation, however that the *Dolphin's* larger 650-millimeter torpedo tubes (vice its standard-size 533-millimeter tubes) may be intended to accommodate a longer-range, indigenously developed submarine-launched cruise missile (SLCM). These suspicions received support when Israel apparently tested a 1,500 kilometer-range, nuclear-capable SLCM in 2000.[100]

In addition to steps that will increase the survivability of its nuclear deterrent, Israel will likely seek to improve both the lethality of its force and its responsiveness. Israeli ballistic missiles are likely quite accurate already; the Jericho II, for example, is reportedly quite similar to the US Pershing II intermediate-range ballistic missile, which had a CEP of approximately 50 meters.[101] Depending on its own capabilities, it may, however, require better targeting data to facilitate an effective reprisal, including high-resolution satellite imagery. Moreover, if Israel wants to

[97] "Israel, Germany in Sub Deal Negotiations," *United Press International*, January 20, 2010.

[98] "Israel Won't Base Submarines in Red Sea, Says Defense Official," *Haaretz* [Reuters], July 5, 2009.

[99] Williams and Rohan, "Israel in Talks to Buy 6th Submarine from Germany"; and Dan Williams, "Could Israel Use Submarines Against Iran?" *Reuters*, April 16, 2008.

[100] Nuclear Threat Initiative, "Submarine Proliferation: Israel Current Capabilities," available at http://www nti.org/db/submarines/israel/index html; GlobalSecurity.org, "Popeye Turbo," available at http://www.globalsecurity.org/wmd/world/israel/popeye-t htm; and Stratfor, "Israel: The Israeli Navy and Iran," July 15, 2009.

[101] Carus, "Israeli Ballistic Missile Developments." Recent press reporting has similarly suggested that Israeli missiles have an accuracy of several dozen meters. Dan Williams, "Israel Could Use Ballistic Missiles Against Iran—Report," *Reuters*, March 17, 2009.

acquire or maintain the capability to execute a preemptive or preventive attack during a crisis, it will likely need an improved counterforce capability, namely warheads capable of destroying deep underground targets, including potential storage sites for Iranian nuclear weapons and delivery vehicles as well as command-and-control centers.[102] In addition, it will almost certainly want more robust intelligence that can provide indications and warnings of an impending Iranian attack (e.g., imagery intelligence, signals intelligence, and human intelligence that could detect if Iranian forces are placed on heightened alert, whether key government officials have dispersed to secure locations, etc.), as well as early warning of an attack that is already underway (e.g., rapid access to data space-based platforms that can detect the heat signature from ballistic missile launches).

Finally, another question Israeli leaders will need to address is how a large an arsenal they will require over time. To date, Israel's nuclear weapons have been considered an option of last resort, to be used only if the nation was *in extremis* and conventional military forces were no longer adequate. Once a nuclear-armed Iran emerges, however, and especially if Iran's nuclear program triggers a proliferation cascade throughout the region, then Israel's nuclear arsenal will be guided by a very different purpose: maintaining a stable nuclear balance with Iran and any other nuclear powers in the region. How Israeli leaders determine what constitutes a stable nuclear balance, and how this influences the size and shape of Israel's nuclear arsenal will depend upon a number of factors: What level of damage must Israel be able to inflict on Iran in the aftermath of a nuclear attack? Will Israel target Iran's nuclear forces, its conventional military forces, its civilian population centers, its critical economic infrastructure, the leadership in Tehran, and to what extent? How will the emergence of additional nuclear powers influence Israel's nuclear doctrine and force structure? Does Israel already have or will it develop thermonuclear warheads? Although it is possible to speculate how Israel might address each of these issues, what seems likely given the experiences of other nuclear powers is that Israel could seek to expand its arsenal significantly, at least if low-end estimates regarding the current size of its arsenal (80-100 warheads) are in fact accurate. How other nations in the Middle East would respond to this development, even if Israel maintained its policy of ambiguity, could have a significant impact on relations between Israel and its neighbors and between the United States and the region as a whole.

SOURCES AND PROSPECTS OF OUTSIDE SUPPORT

Were Israel to undertake initiatives designed to bolster its nuclear arsenal and field a more effective deterrent, it could seek outside assistance in a variety of ways and from several possible sources. For example, although the United States is not currently engaged in designing nuclear warheads and does not manufacture diesel-electric submarines, it could provide resources to help offset the costs of Israeli upgrades, most likely the purchase of additional submarines from European suppliers. Perhaps the most important thing the United States can offer, however, is

[102] Unlike Israel, Iran is unlikely to seriously pursue a counterforce targeting capability due to several factors, including its inability to destroy all Israeli nuclear weapons, especially those at sea; Israel's small size, which ensures that any nuclear attack will be extraordinarily devastating, and the limited accuracy of its missile arsenal. Moreover, the last two factors suggest that it may be easier and more effective for Iran to expand the size of its missile arsenal (to overwhelm Israeli defense and strike more targets) than to qualitatively improve the accuracy of its missiles.

information rather than hardware or financing. This would include targeting data and especially early warning of an attack, which is not only crucial given the short flight times for ballistic missiles launched from Iran, but which the United States is uniquely capable of providing thanks to its constellation of space-based infrared satellites. In exchange, the Israel might share any research it undertakes on the development of warheads optimized to destroy deep underground targets or generate an electro-magnetic pulse (EMP). Other sources of support could emerge as well. There are rumors that Israel's test of a long-range cruise missile in 2000, which took place in the Indian Ocean, was conducted with the support of India.[103] New Delhi, moreover, is currently developing its first nuclear-powered ballistic missile submarines.[104] Should Israel eventually choose to move away from diesel submarines, with their constraints on range, endurance, and payload, and should the United States be unwilling or unable to support Israel in this area, India could perhaps become a potential partner in joint development efforts.[105]

[103] "Germany Sells Israel More Dolphin Subs," *Defense Industry Daily*, January 11, 2010.

[104] Lydia Polgreen, "India Launches Nuclear Submarine," *New York Times*, July 26, 2009.

[105] Defense cooperation between the two nations is hardly a farfetched idea—Israel recently became India's largest foreign arms supplier. Siddharth Srivastava, "Israel Rushes to India's Defense," *Asia Times*, April 2, 2009.

IV. A Proliferation Chain Reaction

Perhaps one of the most significant potential consequences of a nuclear-armed Iran is the prospect that it will trigger further proliferation in the region, exacerbating each of the strategic consequences described in chapter one. As one assessment notes, "The real danger is that Iran's nuclearization would help create a region in which four or five nations are nuclear-armed, instead of just one (Israel). If existing territorial, political, and religious disputes remain unresolved, this is a recipe for nuclear war."[106] This possibility has appeared increasingly realistic over the past several years, as a number of nations in the Middle East and North Africa—many of which view Iran's nuclear program as a serious threat to their security and their status—have begun to take preliminary steps in response, including measures that could lay the foundation for future nuclear weapons programs of their own. This chapter briefly summarizes the actions and attitudes of Iran's neighbors, and assesses the factors that could accelerate or slow a proliferation "chain reaction" throughout the region.

Nuclear Energy and Nuclear Hedging

With the exception of Israel's alleged nuclear program, the Middle East and North Africa have thus far remained free of nuclear weapons, although several nations—including Algeria, Libya, Egypt, Syria, and particularly Iraq and Iran—have seriously considered or actively pursued this capability at some point over the past several decades. There is a growing fear, however, that this situation could change dramatically following the emergence of a nuclear-armed Iran. More than a dozen nations in the region have recently expressed their interest in developing civil nuclear power programs, which had previously received little attention or investment in this part of the world. As King Abdullah II of Jordan observed not long ago, "The rules have changed. Everybody's going for nuclear programs."[107] Egypt, for example, plans to construct four nuclear power plants by 2022, Turkey hopes to build and operate three plants sometime in the next decade, Jordan intends to build a plant by 2017, Algeria hopes to have the first of several nuclear power plants operational by 2020, Saudi Arabia has also declared that it will begin building its first nuclear power plant, and several other Gulf Cooperation Council nations are exploring the possibility nuclear programs as well.[108] Although a number of these states have economic rationales for pursuing nuclear power, including the need to meet rising energy demands spurred by growing populations and increasing urbanization, as well as a desire to maximize the amount

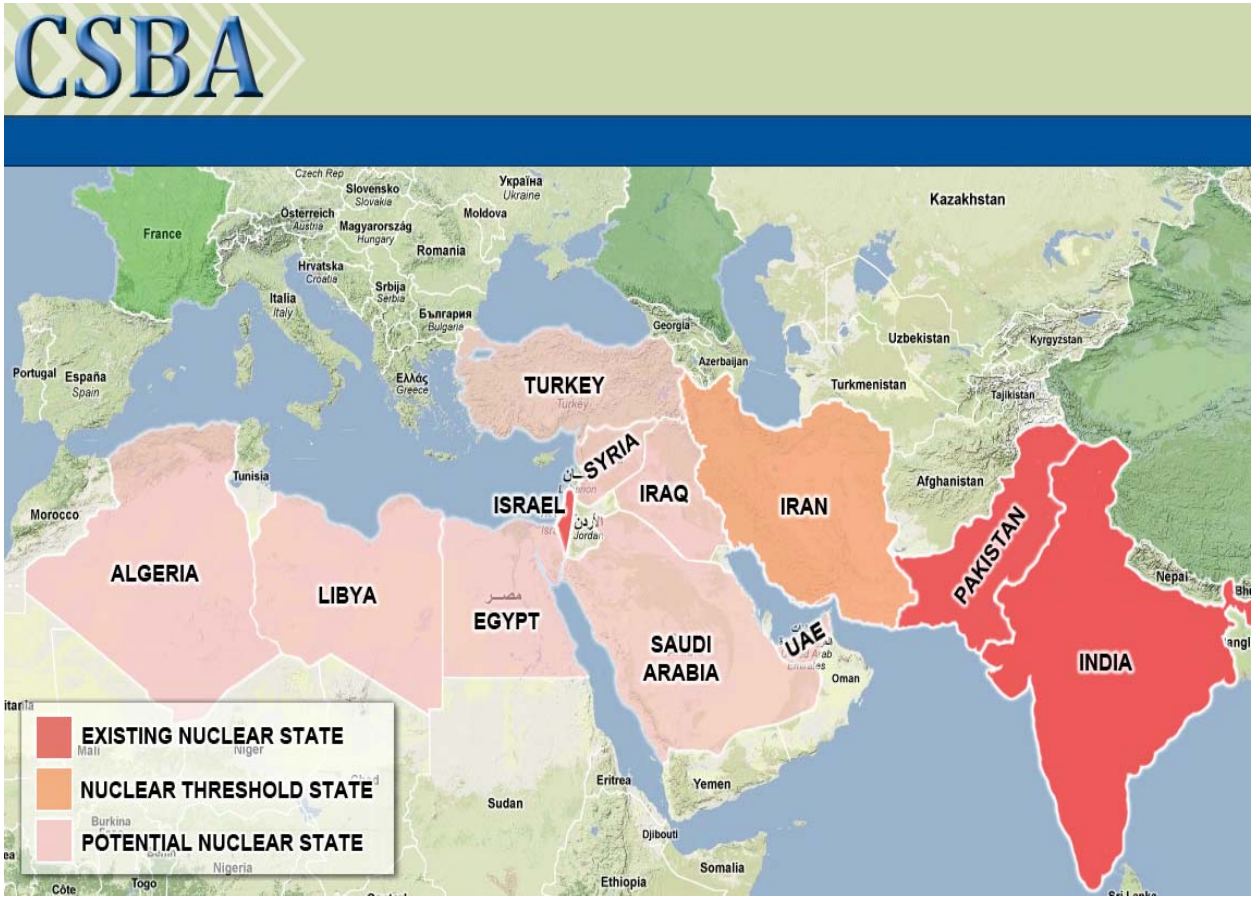
[106] Joseph Cirincione, "A Mideast Nuclear Chain Reaction?" *Current History*, December 2008, p. 440.

[107] Quoted in William J. Broad and David E. Sanger, "With an Eye on Iran, Rivals Also Want Nuclear Power," *New York Times*, April 15, 2007.

[108] "Why Go Nuclear?" *Bulletin of the Atomic Scientists*, September/October 2008, p. 18; "Turkey's President Approves Nuclear Power Plant Law," *Reuters*, November 20, 2007; "Factbox—Nuclear Power Plans in Africa, Middle East," *Reuters*, December 29, 2009; and "Saudi Arabia Plans Nuclear Power Plant," *Global Security Newswire*, August 24, 2009.

of indigenous fossil fuels that are available for export, these moves have been widely interpreted as a hedge against a nuclear-armed Iran.[109]

Figure Four: A Proliferated Middle East



Some and perhaps many of these plans may not come to fruition. Nevertheless, the pursuit of nuclear energy could have a significant impact on the regional security environment in the years ahead because it opens the door to future nuclear weapons programs. Specifically, while the fuel needed to operate nuclear power *reactors* cannot be used in nuclear *weapons*, this development raises concerns because the NPT does not bar members states from developing the sensitive technology required to produce nuclear fuel on their own, i.e., the capability to enrich natural uranium and separate plutonium from spent nuclear fuel. Yet enrichment and reprocessing are key steps that a state would need to master in order to amass enough HEU and/or plutonium to fuel nuclear weapons. Civilian nuclear programs that possess these capabilities are therefore inherently dual-use. This observation has been highlighted by Mohamed El-Baradei, the former Director-General of the IAEA:

[109] Richard Beeston, "Six Arab States Join Rush to Go Nuclear," *The Times*, November 4, 2006; Dan Murphy, "Middle East Racing to Nuclear Power," *Christian Science Monitor*, November 1, 2007; Bob Drogin and Borzou Daragahi, "Arabs Make Plans for a Future with Nuclear Power," *Los Angeles Times*, May 26, 2007; and Joby Warrick, "Spread of Nuclear Capability is Feared," *Washington Post*, May 12, 2008.

> Under NPT rules, there is nothing illegal about any state having enrichment or reprocessing technology…even though these operations can also produce highly enriched uranium or plutonium that can be used in a nuclear weapon. An increasing number of countries have sought to master these parts of the 'nuclear fuel cycle', both for economic reasons and, in some cases, as a good insurance policy for a rainy day—a situation that would enable them to develop at least a crude nuclear weapon in a short span of time, should their security outlook change. Whatever the reason, this know-how essentially transforms them into a 'latent' nuclear-weapon state.[110]

Thus far, Bahrain, the United Arab Emirates, and Saudi Arabia have attempted to relieve these concerns by pledging to forgo uranium enrichment and plutonium reprocessing capabilities, which would require them to purchase any nuclear fuel for domestic nuclear power plants on the international market.[111] Nevertheless, intentions can change, and if Iran does cross the nuclear threshold other nations in the region may attempt to use their civilian nuclear programs to develop the indigenous knowledge, infrastructure, and material that would be required to support a future nuclear weapons capability. As the National Intelligence Council's report *Global Trends 2025* cautioned, "A number of states in the region are already thinking about developing or acquiring nuclear technology useful for development of nuclear weaponry. Over the next 15-20 years, reactions to the decisions Iran makes about its nuclear program could cause a number of regional states to intensify these efforts and consider actively pursuing nuclear weapons."[112]

A Slow or Rapid Cascade?

In general, the indigenous development of nuclear weapons is a long, slow, expensive, and difficult process, even for nations with considerable economic resources, and especially if outside powers attempt to constrain an aspiring nuclear nation's access to critical technology and materials. Thus, even if the proliferation of nuclear energy throughout the Middle East and North Africa poses a long-term danger, without significant external support it is unlikely that any of the nations pursuing nuclear power will be able to develop a nuclear weapons capability for ten or twenty years, and perhaps even longer. Nevertheless, there is one critical variable that could have a significant impact on the pace of a regional nuclear cascade, potentially hastening the arrival of a multipolar nuclear Middle East: Saudi Arabia's response to a nuclear-armed Iran.

If Tehran were to develop nuclear weapons, this would place tremendous pressure on the Saudis to respond in some form. Not only do the two nations have strong geopolitical reasons to balance against one another, but Sunni-Shia religious tensions would also provide an incentive for Saudi

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[110] Quoted in Dalia El-Sheikh, "Nuclear Dynamics," *Al-Ahram*, April 2006, available at http://weekly.ahram.org.eg/2006/789/in4.htm.

[111] Mark Fitzpatrick, "Drawing a Bright Redline: Forestalling Nuclear Proliferation in the Middle East," *Arms Control Today*, January/February 2009.

[112] National Intelligence Council, *Global Trends 2025*, p. 61.

Arabia to acquire nuclear weapons of its own and counter a "Shia bomb."[113] Although Riyadh is already pursuing a nuclear power capability—which could be the first step down a very slow road to nuclear weapons development—there are rumors that it may have an alternative option that would enable it to "go nuclear" far more rapidly, namely by exploiting its close ties to Pakistan.[114] During the 1980s, for example, Riyadh acquired several dozen CSS-2 intermediate-range ballistic missiles from China (which were maintained by Chinese crews) in response to the growing proliferation of missiles throughout the region and their use during the Iran-Iraq War. The CSS-2 is extremely inaccurate, however, and was therefore considered more useful as a delivery system for WMD warheads, including nuclear warheads.[115] According to some reports, the Pakistani government not only played an intermediary role and helped broker the Chinese-Saudi deal; it also planned to sell Saudi Arabia nuclear warheads for the CSS-2s in exchange for financial support for Pakistan's nuclear program.[116]

Suspicions that Riyadh and Islamabad have an agreement that would involve sharing nuclear weapons and/or technology persist today. According to a recent report by the US Senate Foreign Relations Committee, "Many scholars and U.S. diplomats believe that Saudi Arabia may have some sort of formal or informal understanding with Pakistan regarding nuclear weapons."[117] If so, this arrangement could develop in one of several different ways. First, Pakistan could sell Saudi Arabia intact nuclear weapons as well as delivery systems. This is perhaps the least likely option; there is no evidence that any nation has ever transferred nuclear weapons to another party, and the potential international backlash against this move could outweigh any financial gains for Pakistan. Second, Pakistan could offer a virtual "do-it-yourself kit" by providing Saudi Arabia with the necessary infrastructure, material, and technical support to "go nuclear" far more rapidly than it could on its own. Although risky, this option may be more difficult to detect than the delivery of nuclear weapons themselves, and may therefore avoid triggering an international backlash, at least for a time. Pakistan has also been willing to engage in this type of proliferation in the past, and it is hardly the only nation to do so. China, for example, apparently provided Pakistan with enough HEU for two nuclear weapons during the early 1980s in support of the latter's nuclear program.[118] Moreover, Pakistan is currently building two additional heavy water reactors for plutonium production and a second chemical reprocessing facility, and might therefore accumulate much more fissile material than it needs to maintain an acceptable nuclear

[113] "Chain Reaction: Avoiding a Nuclear Arms Race in the Middle East," Report to the Committee on Foreign Relations of the United States Senate, February 2008, p. 12.

[114] Bruce Riedel, "Pakistan and the Bomb," *Wall Street Journal*, May 30, 2009.

[115] Thomas W. Lippman, "Nuclear Weapons and Saudi Strategy," The Middle East Institute Policy Brief, January 2008, p. 2.

[116] Adrian Levy and Catherine Scott-Clark, *Deception: Pakistan, the United States, and the Secret Trade in Nuclear Weapons* (New York, Walker and Company, 2007), pp. 174-175.

[117] "Chain Reaction: Avoiding a Nuclear Arms Race in the Middle East," p. 20.

[118] R. Jeffrey Smith and Joby Warrick, "A Nuclear Power's Act of Proliferation," *Washington Post*, November 13, 2009.

balance with India. This could enable Islamabad to sell a significant quantity of that material to the right buyer and at the right price.[119]

Rather than sell weapons or the material needed to make them, a third possibility would involve a Pakistani extended deterrent guarantee to Saudi Arabia, which could mitigate Riyadh's fears of Iran without imposing significant costs on Islamabad. A fourth and closely related possibility could see Islamabad not only providing a security commitment to Riyadh, but also deploying its own nuclear weapons and delivery systems on Saudi territory to enhance the credibility of this commitment.[120] According to one nuclear proliferation export and government official,

> I don't believe that there's a deal that the Saudis already paid and could take delivery on demand and if I were the Saudis I wouldn't trust the Pakistani[s] to deliver on such a deal. There's no doubt the Saudis have delivered a lot of money to Pakistan, and some went to support the nuclear weapons program. What would be more likely would be that Pakistan would station troops on Saudi soil, and these could include nuclear-armed forces.[121]

This final option could be particularly appealing to both sides for a number of reasons. The Saudis, for example, might prefer a Pakistani deterrent because it can be exercised relatively quickly, it would not necessarily violate the NPT, and stationing foreign Muslim forces on its territory would not trigger the same level of domestic opposition that would accompany the deployment of US forces—something that might be required to make any prospective US extended deterrent commitment credible in the eyes of Iran.[122] For the Pakistanis, deploying nuclear weapons in Saudi Arabia would not only yield financial benefits and international clout; it would also provide added strategic depth with respect to its chief rival, India.[123] Moreover, the United States has already set the precedent of deploying part of its nuclear arsenal abroad to bolster its extended deterrent commitments.

This of course raises a host of difficult questions: How would India respond to this development? Would its reaction depend on whether Saudi or Pakistani military forces (or both) had operational control over the weapons, and would it even be possible to know for certain specific command-and-control arrangements? Would India target Pakistani weapons located in Saudi

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[119] Robert S. Norris and Hans Kristensen, "Nuclear Notebook: Pakistani Forces, 2009," *Bulletin of the Atomic Scientists*, September/October 2009.

[120] Chain Reaction: Avoiding a Nuclear Arms Race in the Middle East," p. 20.

[121] Former Clinton and current Obama administration official Gary Samore, quoted in Lippman, "Nuclear Weapons and Saudi Strategy," p. 9.

[122] The possibility of American extended deterrence commitments are discussed in the next chapter.

[123] It would also severely complicate matters for the United States in the event of Pakistani state failure. In such a contingency, Washington may be confronted with the prospect of having to secure Pakistani nuclear weapons deployed in Saudi Arabia.

Arabia with its own conventional or nuclear weapons, and how would this influence the ladder of escalation during a crisis in South Asia? Would India make changes to its nuclear force posture, for example by placing an even greater emphasis on submarine-launched ballistic missiles? Could a deployment of Pakistani weapons in Saudi Arabia foster closer US-Indian military cooperation, particularly in areas such as missile defenses? How would this in turn affect the US relationship with Pakistan?

What is almost certain, however, is that a Saudi decision to exercise any one of these options would almost certainly be highly destabilizing. Perhaps most importantly, it would significantly increase the incentive for other nations in the region to pursue their own nuclear weapons capability; as one assessment notes, "the Saudi reaction is likely to be the pivot around which inter-Arab debates [over the pursuit of nuclear weapons] revolve."[124] For example, if Saudi Arabia does indeed have some type of arrangement to purchase nuclear weapons or material, it may not be the only one: "it is conceivable that other wealthy Gulf states—most notably the United Arab Emirates—might do the same."[125] Moreover, the likelihood that the UAE or another nation could attempt to purchase a nuclear deterrent will be significantly higher if they are following an example set by Riyadh. Then there is Egypt, which has consistently vied with Saudi Arabia for leadership within the Arab World. If Riyadh acquired nuclear weapons in some form, therefore, it "would represent a uniquely threatening challenge to Egypt's self-conception and regional influence," one that could necessitate a response in kind.[126]

Consider as well the case of Iraq, which once had the most advanced nuclear program in the region. Perhaps the greatest question surrounding Baghdad's future strategic posture is whether it will be influenced primarily by geopolitical considerations or instead by ideology and religion. On the one hand, Baghdad had previously sought to balance Tehran's power in the region throughout the Saddam Hussein era. On the other hand, Iraq is a newly democratic, Shia majority nation, and could choose instead to align with or at least accommodate Iran due in part to their shared religious traditions.[127] Regardless of which one of these motives emerges as the main driver of Iraqi policy, however, an Iraq that is flanked by a nuclear-armed Iran to the east and a nuclear-armed Saudi Arabia to the south and west may have an overwhelming incentive to pursue its own nuclear deterrent. Whereas geopolitics could encourage Baghdad to develop nuclear weapons to help contain Tehran, ideology might compel it to acquire these weapons to counter Riyadh. Finally, the effects of Saudi Arabia's decision could reverberate beyond the

[124] Dalia Dassa Kaye and Frederic M. Wehrey, "A Nuclear Iran: The Reactions of Neighbours," *Survival*, Summer 2007, p. 114.

[125] Bruce Riedel and Gary Samore, "Managing Nuclear Proliferation in the Middle East," in Richard N. Haass and Martin S. Indyk, eds., *Restoring the Balance: A Middle East Strategy for the Next President* (Washington, DC: Brookings Institution Press, 2008), p. 117.

[126] "Chain Reaction: Avoiding a Nuclear Arms Race in the Middle East," p. 32.

[127] Of course, the division between geopolitical and religious motives is an oversimplification; there is still competition between the religious centers of Qom (in Iran) and Najaf (in Iraq), while accommodation can also be the result of Iraqi military and economic weakness.

Arab World as well. According to an analysis of Turkey's positions on nuclear proliferation and the Iranian nuclear weapons program, "the likelihood that Turkey would seek its own path to a nuclear capability, however long this might take, would increase in the event of…a regional nuclear arms race."[128]

Equally important, Saudi acquisition of nuclear weapons could not only increase the incentive for other nations in the region to pursue nuclear weapons, it could also increase their ability to achieve this goal. Specifically, the emergence of a nuclear-armed Saudi Arabia could significantly erode the existing barriers to nuclear proliferation, even if its particular method of acquisition only circumvented rather than violated the NPT. Ultimately, the more nations that acquire nuclear weapons, the more likely it becomes that the NPT regime will collapse, and the more opportunities will then arise for aspiring nuclear powers to receive outside support. This would make the sale or transfer of nuclear weapons, technology, and knowledge far easier, and the timelines for nuclear weapons development far shorter.

Avoiding further proliferation in the region following the emergence of a nuclear-armed Iran may therefore require concerted efforts to prevent Saudi Arabia from sprinting to a nuclear weapons capability via its relationship with Pakistan. It is unclear, however, whether the United States can more effectively address this issue on the "supply side" or the "demand side." On the one hand, the degree of American leverage over Islamabad is questionable given its importance in the war against Islamist terrorist networks throughout the world and especially the Taliban in Afghanistan. On the other hand, Riyadh's status as the world's leading producer of oil, and its role as the world's sole "swing state" producer, may mean that the Saudis may have little to fear from threats by the international community to impose sanctions or other penalties. The United States may therefore have few good options. One measure it appears likely to pursue—extended deterrence—is addressed below.

[128] Henri J. Barkey, "Turkey's Perspective on Nuclear Weapons and Disarmament," in Barry Blechman, ed., *Unblocking the Road to Zero, Vol. VI: Turkey, Japan, Brazil* (Washington, DC: Stimson Center, September 2009), p. 73.

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V. AVOIDING A CASCADE: THE DILEMMAS OF EXTENDED DETERRENCE

According to some commentators, the limited technical infrastructure of nations like Saudi Arabia, the significant economic leverage that the United States has over regional partners such as Egypt, and Turkey's existing security guarantee through its membership in the North Atlantic Treaty Organization (NATO) all suggest that the emergence of a nuclear-armed Iran is unlikely to trigger a proliferation cascade throughout the Middle East.[129] Nevertheless, the previous chapter argued that the possibility of a Saudi-Pakistani connection could significantly alter this assessment, increasing both the likelihood of a cascade and how quickly it unfolds. If so, the United States will have to take more direct, immediate, and serious measures to ensure that nuclear proliferation in the region does not extend beyond Iran. One possible measure would be to extend formal security commitments to American allies and partners in the Middle East, and perhaps to bring them under the US "nuclear umbrella." The hope, of course, is that by doing so these nations will feel less threatened by Tehran and forgo any attempts to pursue their own independent nuclear deterrents.

This option has become increasingly popular over the past several years among a number of analysts and pundits.[130] It has even been raised publicly by Secretary of State Hillary Clinton, who suggested last July that the United States would "extend a defense umbrella over the region" and "do even more to support the military capacity of those in the gulf," to dissuade Iran from pursuing nuclear weapons (and presumably to dissuade US allies and partners from doing so as well).[131] But is extended deterrence—particularly extended *nuclear* deterrence—likely to be an effective strategy for addressing the threat posed by Iran and the danger of nuclear proliferation? Most proponents of this approach argue (or strong imply) that these security commitments will be relatively effortless to implement and sustain, and that they will be adequate to discourage nations in the region from pursuing nuclear capabilities of their own. In short, with little more than a single bold proclamation the United States can preserve at least some stability in the Middle East even if Iran does acquire nuclear weapons. If this were true, it would appear to contradict the notion that proliferation is a very real danger and cannot easily be contained. By

[129] See, for example, Barry Posen, "We Can Live with a Nuclear Iran," *New York Times*, February 27, 2006.

[130] Variations of this proposal have been suggested in Christopher Layne, "Who Lost Iraq and Why it Matters: The Case for Offshore Balancing," *World Policy Journal*, Fall 2007, pp. 43-44; Elizabeth Bakanic, Mark Christopher, Sandya Das, Laurie Freeman, George Hodgson, Mike Hunzeker, R. Scott Kemp, Sung Hwan Lee, Florentina Mulaj, and Ryan Phillips, *Preventing Nuclear Proliferation Chain Reactions: Japan, South Korea, and Egypt*, Woodrow Wilson School, Princeton University, January 2008, p. 21; Christopher Hemmer, "Responding to a Nuclear Iran," *Parameters*, Autumn 2007, pp. 51-52; and Riedel and Samore, "Managing Nuclear Proliferation in the Middle East," pp.116-117. For a skeptical view of the United States' willingness to extend these commitments and their potential effectiveness, see Kurt M. Campbell and Robert J. Einhorn, "Avoiding the Nuclear Tipping Point: Concluding Observations," in *The Nuclear Tipping Point*, p. 334; and NIC, *Global Trends 2025*, p. 62.

[131] Quoted in Mark Landler and David E. Sanger, "Clinton Speaks of Shielding Mideast from Iran," *New York Times*, July 23, 2009.

extension, it would also diminish the notion that a nuclear-armed Iran is a serious threat that has the potential to fundamentally alter security dynamics throughout the entire region.

Unfortunately, this perspective merely takes the misplaced "deterrence optimism" described earlier and applies it even more broadly. In reality, if deterrence was difficult during the Cold War, extended deterrence was certainly not any easier. Ultimately, simple solutions are often attractive, but they are not always as appropriate or as easy as they might seem. In this particular case, extended deterrence may be one of the only promising options available to the United States to forestall a proliferation cascade. If so, it is critical to understand the limitations and potential consequences of this approach.

THE APPEAL OF EXTENDED DETERRENCE

Extended deterrence in particular and alliance commitments more generally played an important role in limiting nuclear proliferation during the Cold War.[132] Some nations, notably Germany and Japan, clearly possessed the resources to become nuclear powers had they chosen to do so, but instead decided to remain under the US nuclear umbrella. In other cases, such as Taiwan and South Korea, US support provided a source of leverage that Washington successfully used to convince nations to abandon their nuclear ambitions before they ever came close to acquiring nuclear weapons. It is hardly surprising, then, that expanding US alliance commitments and extending security guarantees to potential nuclear powers are widely viewed as the best and easiest solutions to the danger of nuclear proliferation.

There are a number of specific reasons to believe that extended deterrence could be an effective strategy for stemming proliferation in the Middle East, as well as an acceptable alternative to nuclear weapons for many nations in the region. First and foremost, the pursuit of nuclear weapons is expensive, difficult, and extremely risky, particularly if a nation does not have significant external support. Although any security commitment entails some loss of independence, seeking a nuclear-armed patron is therefore an attractive option for nations that are insecure but either unwilling or unable to accept these burdens. In the case of Israel, moreover, a clear commitment by the United States could encourage Israel to maintain its posture of nuclear ambiguity and obviate—or at least diminish—the need to expend considerable resources expanding and upgrading its existing nuclear arsenal.

Second, the United States would be building upon an existing and fairly strong foundation of alliance relationships and security partnerships. As noted above, Turkey is already under the US nuclear umbrella by virtue of its membership in NATO. Although the United States does not have a formal alliance with Israel, the two nations are close and longstanding security partners. In fact, Washington has already made public statements that commit it to protecting Israel from an attack, although the precise wording of these statements certainly leaves room for interpretation. Just one year before leaving office, for example, President George W. Bush declared that, "If Iran did strike Israel," the United States would "defend our ally, no ifs, ands, or buts."[133] Finally, the United States also maintains close partnerships with a host of other nations

[132] Campbell and Einhorn, "Avoiding the Tipping Point: Concluding Observations," p. 321.

[133] Quoted in "Bush: We'd Defend Israel in Event of Iranian Strike," *Haaretz* [Reuters], January 1, 2008.

in the region, including Saudi Arabia, Egypt, Bahrain, Qatar, and Jordan, and for the time being has a significant military presence in Iraq.

Third, the United States remains the world's dominant nuclear power and has the world's second largest nuclear arsenal. Moreover, with the possible exception of a Pakistani commitment to Saudi Arabia, it is highly unlikely that any other nuclear power would be willing or able to extend a security guarantee to nations in the Middle East. Although Britain and France have historic ties to the region and the latter in particular appears increasingly concerned about the implications of a nuclear-armed Iran, pledging to defend nations from an Iranian attack would appear to be out of character for both.[134] Instead, they themselves may seek a more robust deterrent from the United States in the form of missile defenses as Iran increases its capability to target Europe. Russia and China, on the other hand, could seek to exploit states' fears of Iran to develop closer ties with nations in the region, for example through increased arms sales or perhaps by attempting to leverage their influence over Tehran—something the United States cannot offer. This possibility may become more likely if the United States does not extend its own security guarantees, leaving Moscow and Beijing to fill the void. Neither power, however, should be expected to consider deterrent commitments that threaten their own relations with Iran.

Fourth, the United States has other unique capabilities that nations in the region are unlikely to develop but will almost certainly want access to, making Washington an attractive partner. These include ballistic missile defenses (which could be used to counter Iran's principal nuclear delivery systems); attribution capabilities such as nuclear forensics (which may be important to discern the origin of an unconventional nuclear attack, and therefore to make retaliatory threats more credible); and early warning systems (which are particularly important given the short flight times of missiles launched from Iran).[135] In sum, if nations prefer to avoid the risks and costs of pursuing their own nuclear program and would rather have the support of a nuclear-armed patron, the United States may be the best—and in many cases the only—option available to them.

THE LIMITS OF EXTENDED DETERRENCE

Despite these factors, there are a number of reasons to be skeptical about the prospects for extended deterrence in response to a nuclear-armed Iran. For example, whether implicitly or explicitly, proponents of extended deterrence draw heavily on Cold War-era analogies, and even

[134] There have been suggestions that the United States, Britain, and France could join together in some form of "collective" deterrence and extended deterrence, whereby all three would pledge to respond to an Iranian attack against themselves or their allies, but it is difficult to imagine what such an arrangement would look like and how it would work in practice. Bruno Tertrais, "Deterring a Nuclear Iran: What Role for Europe?" in *Deterring the Ayatollahs*, p. 18.

[135] Although the possibility of unconventional delivery (such as a nuclear weapon smuggled in the hold of a ship) was a concern during the Cold War, it may be particularly troubling in the wake of a nuclear-armed Iran, for two reasons. First, American ballistic missile defense assets and those of its regional allies could undermine Iran's confidence in its ballistic missile force, which could in turn encourage Tehran to consider other methods of delivery. Second, Iran's extensive use of proxies and its own IRGC-Quds Force could make unconventional delivery methods an attractive delivery option.

suggest that the United States will find its task easier today than it did in the past. Barry Posen, for one, has argued that because "U.S. strategic nuclear forces today are vastly more powerful than anything Iran is likely to be able to deploy, the United States runs less risk in offering such an assurance than it did during the Cold War, and Iran would face very grave risks if it challenged them."[136] Yet this oversimplifies the dilemmas that the United States would face. During the course of the US-Soviet rivalry, the United States and the allies under its nuclear umbrella were not only aligned against a single overriding threat, they also had few serious security challenges amongst themselves, particularly as the Franco-German rivalry faded into the background.[137] Today, however, while most nations in the region appear to view Iran a potential or actual threat, they differ in terms of how serious they consider that threat and what specific form it takes (e.g., subversion, coercion, direct military attack, or some combination of the three). More importantly, relations between nations in the region remain tense and in some cases hostile, a problem that would only be exacerbated if the United States pledged to defend Israel along with several Arab states. These factors will undoubtedly complicate American diplomatic and military efforts in the region, and could limit the United States' ability to influence the behavior of its allies.

Another major concern is the credibility of US security guarantees, which could undermine any extended deterrent commitment before it is ever offered.[138] During the Cold War, the United States deployed several hundred thousand troops to Western Europe, a region populated by democratic nations facing a communist, authoritarian Soviet Union to the east that threatened to control all of Eurasia. In short, the stakes were far higher than they are today, American allies were culturally and politically far more similar to the United States than its current security partners in the Middle East, and US forward-based forces were a clear indicator of its willingness to defend those allies. Nevertheless, given the threat that a conventional war could escalate to a strategic nuclear exchange, there were still persistent questions as to whether the United States would ever be willing to use nuclear weapons against the Soviet Union to stave off a military defeat in Europe. If American allies were never truly convinced that the United States would risk New York to save Bonn, Paris, or London, then why would US allies in the Middle East think that the United States would risk New York to save Riyadh, Cairo, or Dubai once Tehran acquires the means to target the US homeland with nuclear weapons?[139] Compounding this dilemma, in many cases the United States does not have the option of using significant numbers of forward-based forces as a "tripwire" that would signal its willingness to retaliate for an attack

[136] Barry R. Posen, "A Nuclear-Armed Iran: A Difficult but Not Impossible Policy Problem," The Century Foundation, December 6, 2006, p. 13.

[137] The one major exception was the rivalry between Greece and Turkey.

[138] Kathleen J. McInnis, "Extended Deterrence: The U.S. Credibility Gap in the Middle East," *The Washington Quarterly*, Summer 2005.

[139] At the same time, it is hardly clear that there would be sufficient public or political support for an American pledge to defend nations in the Middle East, with the possible exception of Israel, once Iran acquires the capability to target the US homeland with nuclear weapons.

on one of its allies, given the likelihood that a major US military presence would generate a backlash within nations such as Egypt or Saudi Arabia.

Unfortunately, these differences between the Cold War and the current security environment are not the only problems that the United States is likely to confront. There are, for example, a number of other questions regarding the United States' ability (and willingness) to actually implement its deterrent threats, either by punishment or by denial.[140] For example, the United States may be approaching a situation where its nuclear arsenal will be shrinking just as its security commitments are expanding substantially. The current administration is now engaged in negotiations with Russia on further nuclear weapons reductions. According to reports, the new agreement is likely to place a limit of 1,600 warheads and 800 delivery vehicles on each side, down from a previously ceiling of 2,200 and 1,600, respectively.[141] Although the United States traditionally sized and shaped its nuclear arsenal against the Soviet Union, the reality is that Washington is expected to deter attacks against its territory by several different nations (Russia, China, North Korea, and perhaps soon Iran), and, unlike Moscow, must also deter attacks against the growing number of states under its nuclear umbrella. As the US arsenal draws down, however, it will have fewer and fewer weapons to support these commitments. Moreover, because the United States has thus far chosen not to design a new generation of nuclear weapons, the remaining inventory will consist primarily of high yield warheads suitable for countervalue targeting, which contributes to the perception in some quarters that the United States is self-deterred; that is, the belief that it would not be willing to employ nuclear weapons in retaliation for an attack on one of its allies because of the enormous collateral damage and civilian casualties that would result.

At the same time, while ballistic missile defenses provide an important defensive capability against Iran's most likely nuclear delivery systems and therefore contribute to deterrence by denial, these systems are also extremely high-demand/low density assets. As a result, when other requirements are taken into account—in particular the need to protect American allies and bases in East Asia and its allies in Europe—it is unlikely that sufficient ground- and sea-based systems will be available to defend against Iran, particularly as its ballistic missile inventory grows over time. In a crisis, for instance, Iran could engage in saturation attacks using salvoes of conventionally armed missiles. Because existing defense systems cannot discriminate between nuclear and non-nuclear warheads, these attacks could be used to deplete American and allied interceptors, leaving targets vulnerable to follow-on attacks with nuclear weapons and thus susceptible to coercion. In addition to presenting an operational military challenge, this scenario raises a number of uncomfortable questions. For example, would the United States use most or all of its defenses to protect Saudi Arabia, Egypt, or Iraq from a missile attack, knowing that this would leave Israel potentially vulnerable? And would these nations trust the United States to

[140] Deterrence by punishment entails retaliating in the aftermath of an attack. By contrast, deterrence by denial involves decreasing the ability of an adversary to succeed in its attack at an acceptable cost.

[141] Tom Z. Collina, "U.S., Russia Poised for Arsenal Cuts," *Arms Control Today*, December 2009.

defend them during a crisis, knowing that Washington would be extremely reluctant to leave its closest ally unprotected?[142]

Finally, there are at least two other, broader issues that should be taken into consideration. The first is deceptively simple but in fact raises a difficult dilemma: What precisely is the United States attempting to deter? If the US only hopes to discourage Iran from launching a nuclear attack against one of its neighbors and declares this publicly, Tehran could feel free to engage in coercion or low-level forms of aggression, assuming that its behavior will not trigger a significant American retaliation. Yet these actions—not a direct nuclear attack—are precisely the types of threats that nations in the region fear most, and are therefore the reason they would consider an independent nuclear deterrent.[143] In this case, then, the United States could very well succeed at deterring Tehran from starting a nuclear war yet fail to prevent a proliferation cascade. Alternatively, if the United States were to commit itself to retaliating against Iran for actions short of a nuclear attack, these threats may not be credible. In response to this dilemma, the United States could—and likely would—make a more ambiguous commitment, one that was confined to generalities and did not clearly specify what behavior it was attempting to deter or how it would respond if Iran chose to act. Ambiguity is always risky, however, and could encourage Tehran to probe and test in an effort to determine what the United States' redlines actually were—a situation with a high potential for miscalculation and escalation.

The second issue is equally troubling: What if extended deterrence fails to prevent nuclear proliferation? It is possible that one or more nations in the region could use an American security guarantee as a shield that enables them to safely pursue a clandestine nuclear program. This could be a nation's motive for seeking and accepting a US security commitment from the outset, or it could develop over time if American guarantees appear less credible or are merely viewed as insufficient. Moreover, even if the United States discovered that one its allies had pursued or developed an independent nuclear deterrent while under the US umbrella, it is not clear that the US could or should punish the state in question by revoking it security guarantee, for two reasons. First, Washington will want to keep the violator's arsenal as small as possible to minimize the prospects of triggering a regional nuclear arms race, and keeping its extended deterrent commitment in place may be the only way to do so. Second, this commitment will provide leverage that the United States can use in any attempt to convince the new nuclear power (or powers) to relinquish its weapons or fissile material. As a result of these considerations, the United States could find two or more nuclear-armed nations in the region under its own nuclear umbrella, in all likelihood Israel, Saudi Arabia, and perhaps other nations over time. Yet this would introduce a host of complex and unpredictable dynamics into an already unstable situation, particularly since any Arab nuclear power—even a nation like Egypt that has a peace treaty with Israel—would be viewed as a major threat in Israel. The United States might, therefore, find itself in a position where it is simultaneously attempting to deter an Iranian attack on several American allies, to deter two or more of those allies from stumbling into a crisis with

[142] Even seemingly benign capabilities raise difficult questions. For instance, would the United States provide Israel with intelligence of an Iranian mobilization that could indicate Tehran was preparing attack, knowing that Israel might respond by launching a preemptive attack of its own?

[143] Kaye and Wehrey, "A Nuclear Iran: The Reactions of Neighbours," pp. 112-113, 117-119.

one another, and still attempting to dissuade other nations in the region from pursuing their own nuclear weapons. Simply put, this would magnify all the questions of surrounding US capabilities, its credibility, and strategies for maintaining stability described above.

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VI. PRESERVING STABILITY IN A MULTIPOLAR NUCLEAR MIDDLE EAST

As noted above, the possibility exists that even if the United States did extend security guarantees to dissuade nations in the region from pursuing nuclear weapons, its efforts could fail, and over time a multipolar nuclear Middle East could emerge with at least three and perhaps more nuclear powers. Would this environment be stable, and if not, what could the United States do to enhance stability and preserve the tradition of nuclear non-use? This chapter offers some initial observations on these questions.

CRISIS STABILITY IN AN N-STATE NUCLEAR COMPETITION

Although wars are generally undertaken for political reasons, purely military considerations can influence the probability of conflict if one side's forces are particularly vulnerable, a surprise attack is considered feasible, or striking first significantly increases the probability of victory. If some or all of these conditions exist, and the expected gains from launching an attack outweigh the costs of waiting and perhaps being struck first, then nations in the midst of a crisis are far more likely to initiate a conflict.[144] As Thomas Schelling famously argued, "the *likelihood* of war is determined by how great a reward attaches to jumping the gun, how strong the incentive to hedge against war itself by starting it, how great the penalty on giving peace the benefit of the doubt in crisis."[145] For a number of reasons, these dilemmas are likely to be particularly severe in a proliferated Middle East.

Among nuclear-armed powers, the crux of crisis stability is the knowledge that each side has a secure, second-strike capability, so that no nation will launch a nuclear attack in the expectation that it can wipe out its opponents' forces and still avoid a devastating retaliation. If so, then a multipolar nuclear Middle East has the potential to be highly unstable. For example, regional nuclear powers will have limited resources, and beyond a certain point may not be able to continue building nuclear weapons while also protecting those weapons from external attack by investing in hardened missile silos, by maintaining strike aircraft on perpetual high alert, or by developing an undersea nuclear deterrent (for those nations with easy access to the sea).[146] Nor is it clear that these nations will choose the latter at the expense of the former. If they do not, one option they might pursue to increase the survivability of their arsenals is to hide their weapons in locations that would be difficult for others to detect. If so, a single compromise of intelligence could produce a major shift in the nuclear balance and perhaps even trigger an attack.

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[144] Stephen Van Evera, *The Causes of War: Power and the Roots of Conflict* (Ithaca: Cornell University Press, 2001), pp. 69-70.

[145] Thomas Schelling, *Arms and Influence* (New Haven: Yale University Press, 1967), p. 235.

[146] Sagan and Waltz, *The Spread of Nuclear Weapons*, p. 72. Another potential concern, one that applies to several of the Gulf states, is that limited territory prevents nations from using mobile land-based missile systems to enhance arsenal survivability, and increases the likelihood that an adversary can locate and target any weapons located in fixed sites.

There are also choices to be made concerning nuclear posture and command and control systems, both to prevent unauthorized weapons use and to guarantee that a retaliatory strike can be executed even after absorbing the first blow, some of which were discussed in chapter two. For example, given the close proximity of nuclear-armed powers in the Middle East and the very short warning times associated with an intra-regional nuclear strike, these nations may be compelled to adopt "launch on warning" or even preemptive nuclear alert postures, increasing the prospects for escalation and miscalculation. Moreover, if early warning systems—to the extent that they might exist—were not integrated into a robust command and control system, the risk of unauthorized or accidental launch would increase significantly.

The problems associated with maintaining crisis stability would not end here. Despite its best efforts, it may prove difficult for *any* state in a multipolar nuclear competition in the Middle East to deploy a completely secure nuclear arsenal. During the Cold War the United States and Soviet Union essentially had to concern themselves with an attack from a single source: each other. Multipolar systems (or regional subsystems) are generally considered to be far more unstable and conflict-prone than bipolar systems, however, due in large part to the possibility that shifting coalitions could quickly alter the balance of power. This would impact the nuclear balance as well; as Paul Bracken has argued, "concepts of stability and deterrence from the conceptual architecture of two-player games are a poor guide for games with more players."[147] For example, if each of six states possessed 60 weapons, any single state could find itself confronting a coalition armed with 300 weapons against its 60 weapons, giving the coalition a 5:1 advantage in nuclear capability. This could drive nations to increase the size of the arsenal in a continuous effort to achieve some level of parity against possible opposing coalitions. Dilemmas like this would compound issues of arsenal survivability and command-and-control, and could encourage both preventive and preemptive attacks. Finally, given the absence of sophisticated early warning systems and multiple potential attackers, instability could be heightened by the prospect of an ambiguous nuclear strike.[148] Put another way, without systems that can identify the origins of an attack (e.g., early warning satellites; air defense radar stations; etc.), the leadership of the targeted state (assuming it has survived) may not be able to accurately determine which nation launched the attack, presuming the attacker did not publicly identify itself. When combined with the pressure to respond quickly, this would create a significant risk that a retaliatory strike could incorrectly target a third party, potentially triggering a regional nuclear war.

SHOULD DETERRENCE FAIL

Once the United States and the Soviet Union acquired large nuclear arsenals during the Cold War the idea that nuclear wars between the two could be fought to some form of resolution where there would be a "winner" and a "loser" were seen as highly implausible, and thinking about nuclear war-fighting diminished to the point where those who did so were subject to ridicule. As President Eisenhower concluded in a well-known remark, "the only thing worse than

[147] Paul Bracken, "The Structure of the Second Nuclear Age," *Orbis*, Summer 2003, p. 404.

[148] Stephen Peter Rosen, "After Proliferation: What to Do if More States Go Nuclear," *Foreign Affairs*, September/October 2006, p. 10.

losing a global [nuclear] war is winning one."[149] In a proliferated Middle East, however, such a war could be fought and, at least while arsenals remain quite small (and assuming the conflict did not spread to countries with large arsenals such as the United States or Russia), the world would likely survive to confront the aftermath. States armed with a few score fission-based nuclear weapons could wreak unparalleled destruction throughout the region and perhaps beyond. But absent large numbers of thermonuclear weapons, they could survive as functioning societies. If nuclear war-fighting is no longer an unthinkable proposition from a strategic perspective, how might the United States limit the damage or bring an end to hostilities? The answers to these questions are far beyond the scope of this paper. The following observations are made in the spirit of stimulating discussion and analysis so as to better understand the potential consequences should Iran acquire a nuclear weapons capability.

The United States possesses advanced air and missile defense systems. If these systems are within range of a regional state's nuclear-armed delivery systems, they could exert a major influence on the military balance during periods of crisis and war. In a crisis, the United States could threaten to intercept the ballistic missiles of any state engaged in a first-strike against its enemies. It might also threaten to intercept nuclear-capable aircraft and cruise missiles. During an actual conflict, in an effort to impose a cease-fire, the United States could declare that its forces will intercept any ballistic missiles or nuclear-capable aircraft or cruise missiles launched by any power after the cease-fire goes into effect. These options raise a number of dilemmas, however. For one, US forces themselves may become targets of attack, perhaps even a nuclear attack. Second, a nuclear-armed state that enjoys a strong advantage in conventional forces over its nuclear-armed adversary may benefit the United States' efforts to remove nuclear weapons from the conflict. Third, a nuclear-armed state could decide that its best option would be to launch a nuclear attack before US forces can be brought to bear. This would have the effect of reducing stability. Fourth, there is the matter of determining who is launching a nuclear attack. Would the United States be confident that it could identify the source of a nuclear-armed ballistic missile launched from along the Iranian-Pakistani border? What about a nuclear weapon aboard a transport ship that is detonated as the ship comes into port? Finally, the issue of Israel represents a particular dilemma. Given its lack of strategic depth, Israel may feel compelled to strike quickly in the event of a conflict in the belief that it could not sustain even a few detonations on its soil. Would the United States look to intercept an Israeli attack under these circumstances?

If the initial stages of a war between two or more nuclear-armed Middle East states did not involve the use of nuclear weapons, the United States could also threaten to disarm a state of its nuclear weapons by striking them before they can be launched, should launch preparations be identified as being under way. Yet this approach would appear to suffer from many of the problems associated with employing missile defenses to whittle down the arsenal of a nuclear-armed aggressor. To avoid having US forces arrive on the scene too late to influence the calculations of a state (or states) contemplating the first use of nuclear weapons, American forces may need to be forward based. This, however, also has its drawbacks. Washington could find states increasingly reluctant to permit US forces to base in their country, or even to make regular

[149] Quoted in Ronald R. Krebs, *Dueling Visions* (College Station: Texas A&M University Press, 2001), p. 59.

port visits or conduct combined exercises. Were US forces to base forward, they could be at high risk of being targeted in an aggressor's initial nuclear strikes in order to reduce or even eliminate their ability to stabilize a crisis or create intra-war deterrence. Under these circumstances, the United States would likely need to increase its reliance on long-range systems, maritime forces, and stealthy ground forces (i.e., Special Operations Forces).

There is also the matter of war termination. It may be that, following even a modest nuclear exchange of a dozen weapons or so, the belligerents may be so horrified by what they have wrought that the prospect of continuing the conflict is unacceptable. If so, they will still have to find some way of communicating this fact to one another. Here again, the United States' ability to retain effective communications with the warring governments and their willingness to accept the United States as an honest broker could be a key factor in bringing about a cessation of hostilities. The United States could also threaten to enter the conflict on one side or another (or, potentially, against all belligerents) if the warring parties failed to accept a cease fire. This could raise an ironic situation in which the United States employs nuclear weapons to limit damage and bring about a speedy end to the war.

VII. Implications for US Capabilities and Strategy

As the previous chapters have attempted to demonstrate, the emergence of a nuclear-capable or a nuclear-armed Iran would have major strategic implications for the United States, its allies in the Middle East, nations such as Pakistan and India, and perhaps other major power such as Russia and China. Unfortunately, while academics, pundits, and policymakers continue to debate how to prevent Iran from becoming a nuclear power, comparatively little thought has been given to what a world with a nuclear-armed Iran might look like, and what the United States may have to do to maintain stability and secure its interests in that world. Based on the preceding assessment, this chapter discusses several implications for US defense policy and posture.

Preventing a Cascade

If Iran does acquire nuclear weapons, the most important task the United States will be confronted with is preventing a proliferation cascade throughout the region. [redacted]

Over the longer-term, the United States will also need to bolster its existing commitments to its allies in the region and demonstrate its credibility as a security partner. One nation that may require special attention is Turkey. [redacted]

[150] Robert S. Norris and Hans M. Kristensen, "Nuclear Notebook: Worldwide Deployments of Nuclear Weapons, 2009," *Bulletin of the Atomic Scientists*, November/December 2009, pp. 86, 94.

[151] Judy Dempsey, "Ridding Germany of U.S. Nuclear Weapons," *New York Times*, November 28, 2009; and Bob Van Der Zwaan and Tom Sauer, "Time to Reconsider U.S. Nuclear Weapons in Europe," *Bulletin of the Atomic Scientists*, Online Edition, November 23, 2009, available at http://www.thebulletin.org/web-edition/op-eds/time-to-reconsider-us-nuclear-weapons-europe.

[152] Barkey, "Turkey's Perspective on Nuclear Weapons and Disarmament," p. 73.

[redacted]

THE US NUCLEAR ARSENAL

During the Cold War, American nuclear policy was driven by three principal factors: alliance considerations, internal bureaucratic interests, and most importantly the threat posed by the Soviet Union. Although the US-Soviet rivalry officially came to an end in 1991, major decisions relating to the size and shape of the US nuclear arsenal have still been made through the lens of US-Russian strategic relationship, with both sides engaging in substantial nuclear reductions but retaining the capability hold one another's territory, major populations centers, and economic infrastructure at risk. In many ways this perspective made sense. The United States faces no other nuclear-armed competitor or rival on the scale of Russia, and presumably an arsenal that is sufficient to maintain strategic stability between Moscow and Washington is adequate to deter other, lesser threats. [redacted]

Today and especially in the near future, the United States will require the capability to deter attacks by Russia, China, North Korea, and eventually Iran, not only against itself but also against a host of allies in Europe, Asia, and perhaps soon the Middle East. Moreover, although Washington must have the ability to deter a massive nuclear attack against the US homeland by retaliating in kind, it also needs the ability to effectively deter the use of nuclear weapons against its military forces, bases, and allies during a conventional conflict with a nuclear-armed regional power like Iran.[153] [redacted]

[redacted]

[153] Keir A. Lieber and Daryl G. Press, "The Nukes We Need," *Foreign Affairs*, November/December 2009.

AIR AND MISSILE DEFENSES

Air and especially missile defenses will be particularly important once Iran acquires nuclear weapons—especially given Tehran's emphasis on ballistic missiles as its apparent delivery system of choice—because they reduce the likelihood of a successful attack, thus contributing to deterrence by denial. [redacted]

[redacted]

[redacted]

[155] Thomas Ehrhard, Andrew Krepinevich, and Barry Watts, "Near-Term Prospects for Battlefield Directed Energy Weapons," *CSBA Backgrounder*, January 2009.

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VIII. SUGGESTIONS FOR FURTHER RESEARCH

As the preceding discussion suggests, the implications for US strategy and military requirements resulting from nuclear proliferation in the Middle East and South Asia are likely to be profound. Consequently, further research may be warranted in the following four areas of inquiry:

A NUCLEAR-ARMED IRAN AND A PROLIFERATED MIDDLE EAST

A more detailed assessment is needed to identify changes in US strategy and military requirements necessary to deter nuclear attacks and preserve stability if the world is confronted by a nuclear-armed Iran, to include those stemming from a bipolar Israeli-Iranian nuclear competition and a prospective proliferation "cascade" involving other states in the region (e.g., Egypt, Saudi Arabia; Turkey). Such an assessment should explore specific US strategic options for preserving a stable, favorable nuclear balance in the wake of Iran's development of a nuclear capability. How might Iran posture its nuclear capability? Would it field nuclear weapons but not publicly acknowledge it, as some have asserted Israel has done? What would be the implications for an Israeli-Iranian nuclear balance? How would a non-declared Iranian nuclear capability affect the calculations of regional powers with regard to their pursuing a nuclear weapons capability? What specific strategic options would the United States have to preclude further proliferation? What kind of Israeli nuclear posture would best insure a favorable, stable nuclear balance between it and Iran? What strategic options does the United States have to encourage Israel to adopt such a posture? Is it possible to craft a strategy that can reasonably be expected to both deter nuclear weapons use and nuclear weapons proliferation? What are the principal contingencies or scenarios this strategy should be capable of addressing? How might this strategy preclude the development of a nuclear arms market following Iran's acquisition of a nuclear capability? For any given strategy, what types of military capabilities will the US military need to undergird the credibility of the strategy, and on what scale? Where will these capabilities need to be positioned? What role are allies and partners expected to play in supporting this strategy? Finally, what are the critical underlying assumptions of the strategy, and what "hedges" exist that can be exercised in the event these assumptions fail to prove out?

THE SOUTH ASIA NUCLEAR COMPETITION: PAKISTAN'S STABILITY AND IMPLICATIONS FOR THE MIDDLE EAST NUCLEAR BALANCE

An assessment is needed that addresses changes in US strategy and military requirements that might emerge from the ongoing nuclear competition between India and Pakistan, [redacted] to include the prospect that this competition could become part of a broader regional nuclear competition stretching from the shores of the Eastern Mediterranean to the Bay of Bengal (e.g., [redacted] This nuclear competition could significantly complicate US efforts to preserve stability in the Middle East/Persian Gulf region in the wake of Iran's fielding a nuclear capability. Such an assessment would provide a brief overview of the current nuclear balance between India and Pakistan and examine key factors and trends that could significantly shift the balance over time, with

emphasis on how this might influence the Middle East nuclear balance. This assessment would also explore how an Iranian nuclear capability might influence the way in which India and Pakistan think about their own nuclear competition, with primary focus on the potential impact of their nuclear relationships with countries in the Middle East/Persian Gulf region in the form of extended deterrence or through efforts to achieve greater strategic depth. Among the issues that might be addressed are: How can the United States best influence the South Asian nuclear balance so as to best achieve its overall security objectives? [redacted] What are the principal contingencies or scenarios this strategy should be capable of addressing? What military capabilities will the US military need, and on what scale, to support its strategy? Where will these capabilities need to be positioned? What role are allies and partners expected to play in supporting this strategy?

[redacted]

GLOSSARY

BMD	Ballistic Missile Defense
C2	Command-and-Control
CEP	Circular Error Probable
EMP	Electromagnetic Pulse
ESD	Environmental Sensing Device
HEU	Highly Enriched Uranium
IAEA	International Atomic Energy Agency
IRGC	Iranian Revolutionary Guards Corps
LEU	Low Enriched Uranium
NATO	North Atlantic Treaty Organization
NASIC	National Air and Space Intelligence Center
NPT	Non-Proliferation Treaty
PAL	Permissive Action Link
SLCM	Submarine-Launched Cruise Missile
TEL	Transporter-Erector-Launcher
WMD	Weapons of Mass Destruction