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Nuclear proliferation in the Middle East: in pursuit of a regional logic

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NUCLEAR PROLIFERATION IN THE MIDDLE EAST: IN PURSUIT OF A REGIONAL LOGIC

by

Andrea K. Boylan

March 2018

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Scholarly literature has emphasized the role of the regional security environment in driving nuclear proliferation following the end of the Cold War. Nevertheless, few studies have examined regional nuclear dynamics. This dissertation investigates what drove proliferation trends over time in the Middle East, a conflict-ridden region. Over three time periods, representing the bipolar period (1973–1990), the unipolar period (1991–2003), and the multipolar period (2004–2013), did proliferation increase or decrease? And did system-level or regional-level factors drive the change? In contrast to mainstream arguments that nuclear proliferation was contained during the Cold War but could be expected to increase after its end, this research finds that nuclear proliferation in the Middle East increased during the Cold War period but decreased after its end. Specifically, superpower competition during the Cold War seemed to foster greater nuclear proliferation among client states. The reduction of great power competition following the end of the Cold War allowed the sole superpower, the United States, to better manage proliferation issues and strengthen existing or create new multilateral mechanisms to control these threats. In the recent, less structured multipolar environment, great powers came together to manage proliferation with their efforts bolstered by the nonproliferation regime.

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**NUCLEAR PROLIFERATION IN THE MIDDLE EAST:
IN PURSUIT OF A REGIONAL LOGIC**

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ABSTRACT

Scholarly literature has emphasized the role of the regional security environment in driving nuclear proliferation following the end of the Cold War. Nevertheless, few studies have examined regional nuclear dynamics. This dissertation investigates what drove proliferation trends over time in the Middle East, a conflict-ridden region. Over three time periods, representing the bipolar period (1973–1990), the unipolar period (1991–2003), and the multipolar period (2004–2013), did proliferation increase or decrease? And did system-level or regional-level factors drive the change? In contrast to mainstream arguments that nuclear proliferation was contained during the Cold War but could be expected to increase after its end, this research finds that nuclear proliferation in the Middle East increased during the Cold War period but decreased after its end. Specifically, superpower competition during the Cold War seemed to foster greater nuclear proliferation among client states. The reduction of great power competition following the end of the Cold War allowed the sole superpower, the United States, to better manage proliferation issues and strengthen existing or create new multilateral mechanisms to control these threats. In the recent, less structured multipolar environment, great powers came together to manage proliferation with their efforts bolstered by the nonproliferation regime.

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I. NUCLEAR PROLIFERATION IN THE REGIONAL CONTEXT

The nuclear age began on July 16, 1945, at Alamogordo, New Mexico, with the first explosion of a nuclear weapon. Seeking to bring World War II to a quick end, the United States dropped a uranium-235 bomb on Hiroshima, Japan, on August 6 and a plutonium bomb on Nagasaki, Japan, on August 9, resulting in approximately 200,000 deaths.[1]

From the beginning, the United States was preoccupied with controlling the spread of nuclear weapons and discussed proposals with World War II allies for international control of nuclear technology, facilities, and materials. In the end, the United States acted unilaterally. The U.S. Congress passed the Atomic Energy Act in September 1945 that prohibited sharing nuclear technology with any state. Nevertheless, nuclear weapons technology spread. The Soviet Union acquired nuclear weapons in 1949. The United Kingdom conducted its first nuclear test in 1952. France followed with a nuclear test in 1960. China tested its first nuclear weapon in 1964.

The United States decided to promote the peaceful use of nuclear technology. In a December 1953 speech, President Dwight Eisenhower launched the "Atoms for Peace" initiative and introduced the idea of creating an international agency that could help oversee the use of nuclear technology for peaceful purposes in other countries.[2] This speech led to the creation of the International Atomic Energy Agency (IAEA) in 1957 and the amendment of the Atomic Energy Act. After much negotiation, the establishment of the Nuclear Nonproliferation Treaty (NPT) followed in 1968. The treaty enshrined the right to the peaceful use of nuclear technology and a commitment from states possessing nuclear weapons to eventual disarmament. The NPT created the IAEA safeguards system to monitor compliance and created three categories of states—nuclear weapon states,

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[1] "70 Years after Nagasaki Bombing, Atomic Debate Yields Little Consensus," *New York Times*, August 8, 2015, https://www.nytimes.com/2015/08/09/world/asia/on-70th-anniversary-of-nagasaki-bombing-atomic-debate-yields-little-consensus.html.

[2] "Dwight D. Eisenhower, "Atoms for Peace Speech" (speech, New York, December 8, 1953), International Atomic Energy Agency, accessed May 21, 2017, https://www.iaea.org/about/history/atoms-for-peace-speech.

non-nuclear weapon states, and states that refused to be a part of the treaty. Through the prism of the NPT, any state acquiring nuclear weapons beyond the original five nuclear weapon states was considered an illicit nuclear power.

These international regimes have not prevented states from pursuing nuclear weapons. Since 1945, 25 states attempted to obtain nuclear weapons, but they did not either acquire or keep them.[3] Three additional states, India, Pakistan, and North Korea, eventually obtained nuclear weapons. Furthermore, Middle Eastern states, such as Egypt, have regularly accused Israel of acquiring nuclear weapons.[4] Nevertheless, one could also say that nonproliferation efforts have been a wild success. Nuclear weapons technology has existed since 1945 and few states have obtained and kept nuclear weapons. States from various world regions have opted to forego the pursuit of nuclear weapons joining together to form nuclear-weapon-free zones (NWFZs). Other regions, however, appear to be more prone to proliferation.

A. UNDERSTANDING REGIONAL NUCLEAR PROLIFERATION

Why are some world regions rife with nuclear proliferation, while others have established nuclear-weapon-free zones? Why have some regions reversed a trajectory toward nuclear proliferation and others have not? From a conceptual or policy perspective, there has not been an adequate understanding as to why regions move toward or away from proliferation. Can one theory account for variations over time? Does one theory explain specific periods better than others?

Studies on nuclear proliferation after the end of the bipolar-era of the Cold War, or the "second nuclear age," have highlighted the importance of looking at nuclear issues

[3] Ariel E. Levite, "Never Say Never Again: Nuclear Reversal Revisited," *International Security* 27, no. 3 (January 1, 2003): 62, https://doi.org/10.1162/01622880260553633.

[4] For example, see "Nasser Threatens Israel on A-Bomb," *New York Times*, December 24, 1960.

in a regional context.[5] Vipin Narang characterizes the second nuclear age as having "a growing number of regional nuclear powers, complicated multipolar nuclear interactions, and unstable conflict dynamics."[6] Paul Bracken states that "regional nuclear arms races, crises in the regions, and nuclear competition among major powers are likely parts of the second nuclear age."[7] If regional nuclear issues predominate in the second nuclear age, what is the most useful way to study them?

To examine this question and to compare the various explanations, I take an approach that evaluates two levels of analysis—systemic and regional—to study a geographic region over time. Within these levels of analysis, I seek to determine which theories and variables provide the most explanatory power for horizontal nuclear proliferation in the regional context. I test a variable drawn from a theory within each of these levels of analysis to determine which variable and theory provide the most explanatory power for regional nuclear proliferation.

System-level theories might help us understand why nuclear proliferation trends change over time. What system-level theories exist for regional nuclear proliferation? I review these kinds of theories in the first section.

1. System-Level Theories

How might systemic factors shape the regional context? Ashley Tellis, along with Alagappa and Narang, emphasize the effect on nuclear dynamics of the systemic shift

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[5] For example, see Vipin Narang, *Nuclear Strategy in the Modern Era: Regional Powers and International Conflict* (Princeton, NJ: Princeton University Press, 2014); Paul Bracken, *The Second Nuclear Age: Strategy, Danger, and the New Power Politics* (New York: Henry Holt and Company, 2013); and Muthiah Alagappa, ed., *The Long Shadow: Nuclear Weapons and Security in 21st Century Asia* (Palo Alto, CA: Stanford University Press, 2008). Also, this is the definition of the second nuclear age proposed in Colin S. Gray, *The Second Nuclear Age* (Boulder, CO: Lynne Rienner Pub, 1999). For an alternative definition, see Etel Solingen, *Nuclear Logics : Contrasting Paths in East Asia and the Middle East* (Princeton, NJ: Princeton University Press, 2007) or Paul Bracken, "The Structure of the Second Nuclear Age," Orbis 47, no. 3 (2003): 399–413, doi: 10.1016/S0030-4387(03)00042-5.

[6] Narang, *Nuclear Strategy in the Modern Era*, 311.

[7] Bracken, *The Second Nuclear Age*, 3.

from bipolarity to multipolarity.[8] Looking at shifts in the international system may help explain regional nuclear proliferation over time.

Kenneth Waltz's theorizing about the effect of bipolarity versus multipolarity in the international system underpins this argument regarding system shifts. Waltz asserts that the international system changed from a multipolar system to a bipolar system, which was more stable, with the advent of the Cold War.[9] This stability was due to four factors: "the absence of peripheries," "the range and intensity of competition," "the persistence of pressure and crisis," and the superpowers' "preponderant power."[10] He notes that the first three points "combine to produce an intense competition."[11] This superpower competition led the two superpowers to be involved all over the globe, sometimes in countries that otherwise might not have been deemed to be of strategic interest, such as U.S. involvement in Korea in the 1950s.[12] During the Cold War, this international involvement, along with "preponderant power," allowed the superpowers to maintain leverage over states that chose to align with them, to include the arena of nuclear proliferation.[13] This line of thinking concludes that this level of external management of regional states and general system stability came to an end with bipolarity.

As an example of superpower management, the United States worked to limit Iran's nuclear acquisitions under the Shah in the mid- to late 1970s due to proliferation concerns.[14] The United States also strongly pressured South Korea to curtail its nuclear

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[8] Ashley J. Tellis, Abraham M. Denmark, and Travis Tanner, *Strategic Asia 2013–14: Asia in the Second Nuclear Age* (Washington, DC: National Bureau of Asian Research, 2013); Alagappa, *The Long Shadow*; Narang, *Nuclear Strategy in the Modern Era*.

[9] Kenneth N. Waltz, *Theory of International Politics*, First Edition (Boston, MA: McGraw-Hill, 1979), 71;Waltz characterized bipolarity as "a great gap between the power of two leading countries and the power of the next most considerable states" in "The Stability of a Bipolar World," Daedalus 93, no. 3 (July 1, 1964): 892.

[10] Waltz, "The Stability of a Bipolar World," July 1, 1964, 886.

[11] Ibid.

[12] Ibid., 882.

[13] Ibid., 888.

[14] William Burr, "A Brief History of U.S.-Iranian Nuclear Negotiations," *Bulletin of the Atomic Scientists* 65, no. 1 (January 1, 2009): 21–34, https://doi.org/10.2968/065001004.

ambitions resulting in the country signing the NPT in 1975 and a U.S. security guarantee.[15]

What followed bipolarity and what did that mean for global stability, security guarantees, and, consequently, nuclear proliferation? Benjamin Frankel predicts in a 1993 article that superpower guarantees, "the most effective instrument to moderate the effects of systemic characteristics," would be weakened leading to increased instability and insecurity in a more anarchical international system.[16] This insecurity would cause more countries to seek nuclear weapons.[17] John Mearsheimer assesses, also in a 1993 article, that the bipolarity of the Cold War era would revert back to multipolarity increasing global instability.[18] To counteract the ill effects of multipolarity in Europe that led to two world wars, Mearsheimer advocates for "carefully managed proliferation of nuclear weapons in Europe" to restore regional stability following this shift in the international system.[19] Have there been signs of increasing nuclear proliferation since the end of the Cold War? Perhaps the surge of interest in nuclear power worldwide, suggesting a nuclear hedging strategy, is a sign of increasing regional insecurity.[20]

In the transition from bipolarity to multipolarity, however, a number of scholars have advocated for the existence of a unipolar period in the international system. Waltz assesses that the international system would revert to multipolarity, accompanied by decreased stability, fairly quickly, but he himself acknowledges that a "unipolar moment"

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15 "Profile for South Korea," Nuclear Threat Initiative, accessed March 24, 2017, http://www.nti.org/learn/countries/south-korea/.

16 Benjamin Frankel, "The Brooding Shadow: Systemic Incentives and Nuclear Weapons Proliferation," *Security Studies* 2, no. 3–4 (June 1, 1993): 37, https://doi.org/10.1080/09636419309347519.

17 Ibid.

18 John J. Mearsheimer, "Back to the Future: Instability in Europe after the Cold War," *International Security* 15, no. 1 (July 1, 1990): 6, https://doi.org/10.2307/2538981.

19 Ibid., 54; This is a similar line of reasoning to the one put forth in Kenneth N. Waltz, "The Spread of Nuclear Weapons: More May Be Better," *The Adelphi Papers* 21, no. 171 (September 1, 1981), doi:10.1080/05679328108457394.

20 "Emerging Nuclear Energy Countries," World Nuclear Association, October 2016, http://www.world-nuclear.org/info/Country-Profiles/Others/Emerging-Nuclear-Energy-Countries/.

occurred after the Cold War.[21] On one hand, Waltz argues that a unipolar system is less stable than either a bipolar or a multipolar one.[22] On the other hand, William Wohlforth asserts in a 1993 article that the unipolar system with the United States as the sole superpower is both peaceful and durable owing to the distribution of material capabilities favoring the United States.[23] In this sense, the United States as the sole superpower in the international system would still have the capability to manage regional security issues, to include nuclear proliferation, through guarantees and alliances, and its "preponderant power," as it did in tandem with the Soviet Union during the Cold War.

What signs exist in the regional nuclear realm of a unipolar period following the Cold War? Perhaps the best example is the destruction of Iraq's nuclear program in 1991 by the United States. While the purpose of the war was not to destroy Iraq's nuclear program, it was a fortuitous side effect. Arguably, the United States could make the largely unilateral decision to invade Iraq, because the Soviet Union was not around to oppose it.

What other theories might help provide system-level explanations for regional nuclear proliferation? Glenn Chafetz promotes the role of a security community to manage nuclear proliferation. He assesses that at the end of the Cold War there would be more threats of nuclear proliferation in "periphery" states, which have little to no experience with liberal democracy, and respond in a more traditional manner to threats.[24] On the other hand, the "core" makes up a pluralistic security community that "can dampen the urges to conflict and the danger of proliferation in much of the world."[25]

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[21] Kenneth N. Waltz, "Structural Realism after the Cold War," *International Security* 25, no. 1 (2000): 30; The idea of a "unipolar moment" originated in Charles Krauthammer, "The Unipolar Moment," *Foreign Affairs* 70, no. 1 (January 1, 1990): 23–33, doi:10.2307/20044692. He asserted that the international system would quickly return to multipolarity and unipolarity would not be enduring.

[22] Kenneth N. Waltz, "Evaluating Theories," *American Political Science Review* 91, no. 4 (December 1, 1997): 915, https://doi.org/10.2307/2952173.

[23] William C. Wohlforth, "The Stability of a Unipolar World," *International Security* 24, no. 1 (1999): 7–8. Wohlforth defines stability as peacefulness and durability.

[24] Glenn Chafetz, "The End of the Cold War and the Future of Nuclear Proliferation: An Alternative to the Neorealist Perspective," *Security Studies* 2, no. 3–4 (June 1, 1993): 128, 139, https://doi.org/10.1080/09636419309347522.

[25] Ibid., 146.

Unfortunately, Chafetz wrote in 1993 before India emerged as a nuclear power. The case of India demonstrates that liberal democracies do exist outside of this core and they can become nuclear weapon states too. Dividing the world in this manner does not so easily explain proliferation tendencies.

By contrast, Richard Price and Nina Tannenwald argue that system-level pressures to proliferate or not are largely socially constructed as a nuclear weapons taboo has led to the non-use of nuclear weapons.[26] They fault realism and neoliberal institutionalism for being unable to explain at the system level where the nuclear taboo originated.[27] Are NWFZs a manifestation of the non-use norm, i.e., since nuclear weapons cannot be used anyway why seek to develop them? The counterargument is that the states that pursue or have obtained nuclear weapons attach a significant value to them despite their non-use since 1945.

Robert Keohane provides another possible approach to the nuclear proliferation question. He argues that hegemons establish international regimes for self-serving reasons, primarily to facilitate cooperation around issues important to them.[28] The most powerful members of a regime will shape it largely out of self-interest.[29] Norms, or standards of behavior, delineate what kind of behavior is acceptable in the context of the regime.[30] He asserts that while a hegemon may decline, it does not necessarily translate to regime decline.[31] The usefulness of the regime can continue. How might Keohane's ideas apply to the nonproliferation regime? Might this international regime play a role in nuclear proliferation trends?

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[26] Richard Price and Nina Tannenwald, "Norms and Deterrence: The Nuclear and Chemical Weapons Taboos," in *The Culture of National Security: Norms and Identity in World Politics*, ed. Peter J. Katzenstein (New York: Columbia University Press, 1996), 114–52.

[27] Ibid., 123.

[28] Robert O. Keohane, *After Hegemony: Cooperation and Discord in the World Political Economy* (Princeton, NJ: Princeton University Press, 1984), 49.

[29] Ibid., 63.

[30] Ibid., 57–58.

[31] Ibid., 107.

As demonstrated above, Waltz's propositions on system stability and external management play a key role in realist assertions regarding nuclear proliferation. Given its importance in the proliferation literature, it is worth testing its explanatory power for regional proliferation.

Regional dynamics might play a role in nuclear proliferation trends. A review of dynamics in various world regions in the second section highlights divergent outcomes. What might account for these differences?

2. Regional Nuclear Trends

In Latin America, Cuba hosted Soviet nuclear weapons on its soil resulting in the 1962 Cuban Missile Crisis. Brazil put forward a proposal during this crisis to the United Nations General Assembly to establish a NWFZ in Latin America.[32] Another version was proposed to the United Nations General Assembly by Mexico in 1963, and this version passed. The treaty entered into force in 1969. In terms of nuclear capabilities, Mexico began producing nuclear power in 1989.[33] Also, Argentina and Brazil extensively developed their nuclear programs through the early 1990s to the point that the programs raised concerns regarding the states' nuclear intentions.[34] In the 1990s, however, both countries signed the NPT and the NWFZ treaty for Latin America and the Caribbean, the Treaty of Tlatelolco. This followed a transition to stronger civilian control over their nuclear programs. Cuba was the last country in the region to sign the treaty, which it did in 2002, making Latin America a model for NWFZs.

The region of Europe has a diverse nuclear history. The United Kingdom and France are NPT-sanctioned nuclear weapon states. Ariel Levite notes that Germany, Italy, the Netherlands, Norway, Romania, Sweden, Switzerland, and Yugoslavia pursued

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[32] "Latin America Nuclear Weapons Free Zone Treaty (Treaty of Tlatelolco)" Arms Control Association, accessed December 26, 2014, https://www.armscontrol.org/documents/tlatelolco.

[33] "Nuclear Power in Mexico," World Nuclear Association, June 2016, http://www.world-nuclear.org/information-library/country-profiles/countries-g-n/mexico.aspx.

[34] "Profile for Argentina," Nuclear Threat Initiative, accessed March 15, 2017, http://www.nti.org/learn/countries/argentina/; "Profile for Brazil," Nuclear Threat Initiative, accessed March 16, 2017, http://www.nti.org/learn/countries/brazil/.

nuclear weapons programs at some point, particularly at the beginning of the Cold War, and reversed course.[35] Belgium, Germany, Italy, and the Netherlands host U.S. nuclear weapons as North Atlantic Treaty Organization members.[36] In terms of former Soviet bloc countries, Estonia hosted nuclear facilities and Poland hosted nuclear warheads. Belarus hosted a number of Soviet nuclear warheads during the Cold War.[37] Georgia has Soviet-era nuclear reactors, nuclear research institutes, and radioactive waste.[38] Ukraine hosted a significant Soviet-era nuclear arsenal, but, along with Belarus, opted to return them to Russia and sign the NPT.[39] While the region has been largely pacific, Cold War-like tensions returned to the region in 2014 when Russia intervened militarily in the Ukraine.[40]

In Africa, South Africa acquired nuclear weapons in the 1980s before unilaterally ending the program in 1989.[41] In Algeria, a combination of suspicions over the Es-Salam research reactor's large cooling towers and the defenses surrounding the site, led to speculation that the country sought to develop a nuclear weapons program.[42] Subsequently, Algeria brought the facility under IAEA safeguards. Today, these states

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[35] Levite, "Never Say Never Again," 62.

[36] Robert S. Norris and Hans M. Kristensen, "U.S. Tactical Nuclear Weapons in Europe, 2011," *Bulletin of the Atomic Scientists* 67, no. 1 (2011): 64–65, https://doi.org/10.1177/0096340210393931. For this study, Turkey, which also hosts U.S. nuclear weapons as a NATO member, is considered a part of the Middle East political and security dynamic rather than a part of Europe.

[37] "Profile for Belarus," Nuclear Threat Initiative, accessed March 17, 2017, http://www.nti.org/learn/countries/belarus/.

[38] "Profile for Georgia," Nuclear Threat Initiative, accessed March 18, 2017, http://www.nti.org/learn/countries/georgia/.

[39] "Profile for Ukraine—Nuclear," Nuclear Threat Initiative, accessed March 18, 2017, http://www.nti.org/learn/countries/ukraine/nuclear/.

[40] Doug Bandow, "Ukraine Wants to Join NATO and Fight Russia: U.S. Must Say No and Make Alliance an Issue of Security, Not Charity," *Forbes*, accessed December 26, 2014, http://www.forbes.com/sites/dougbandow/2014/12/26/ukraine-wants-to-join-nato-and-fight-russia-u-s-must-say-no-and-make-alliance-an-issue-of-security-not-charity/.

[41] "Profile for South Africa," Nuclear Threat Initiative, accessed March 13, 2017, http://www.nti.org/learn/countries/south-africa/.

[42] "Profile for Algeria," Nuclear Threat Initiative, accessed March 21, 2017, http://www.nti.org/learn/countries/algeria/.

are members of a NWFZ treaty, the Treaty of Pelindaba, which entered into force in 2009, and encompasses the majority of African states.[43]

In the Middle East, despite pursuit of nuclear weapons programs by Iraq and Libya and likely pursuit by Egypt, Iran, and Syria, none of these countries acquired nuclear weapons.[44] While Egypt and Iran began calling for a NWFZ in 1974, no progress has been made toward establishing such a regional agreement.[45] Israel holds out that in order to negotiate such an agreement the region's Arab states must recognize Israel's right to exist.[46] Regional relations are characterized by mistrust and conflict; regional rivalry persists. Today, concerns regarding Iran have come to the fore as the country has advanced its nuclear program, at times hiding its activities from the international community. Negotiations over Iran's nuclear program began in earnest in 2013 with the primary sticking point being Iran's insistence on its right to a nuclear enrichment capability. The negotiating parties reached a landmark agreement in 2016. Finally, a nascent nuclear renaissance has resulted in numerous declarations by regional states to develop nuclear power.

In South Asia, India and Pakistan possess nuclear weapons and are party to an intense, ongoing rivalry. Neither state has ever signed the NPT. India conducted its first nuclear test in 1974 and formally acknowledged its status as a nuclear weapon state in 1998.[47] Pakistan began to develop its program in the mid-1970s and tested a nuclear device in 1998.[48] Geopolitically, India sees Pakistan and China as security threats and the

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[43] Libya will be discussed as a part of the Middle East region.

[44] Turkey maintains nuclear weapons on its territory, but they belong to the United States and they are stationed in the country due to NATO requirements.

[45] Gawdat G. Bahgat, *Proliferation of Nuclear Weapons in the Middle East* (Gainesville, FL: University Press of Florida, 2007), 154.

[46] Shay Feldman, *Nuclear Weapons and Arms Control in the Middle East* (Cambridge, MA: MIT Press, 1996), 250.

[47] "Profile for India—Nuclear," Nuclear Threat Initiative, accessed March 27, 2017, http://www.nti.org/learn/countries/india/nuclear/.

[48] "Profile for Pakistan—Nuclear," Nuclear Threat Initiative, accessed March 28, 2017, http://www.nti.org/learn/countries/pakistan/nuclear/.

focus of its nuclear arsenal.[49] Pakistan, on the other hand, sees India as its nuclear rival and the focus of its nuclear arsenal.[50] The tensions between India and Pakistan, particularly over the disputed Kashmir region, have led to international concern regarding a possible nuclear incident occurring in the region.

Central Asia played a role, although likely unwillingly, in the Soviet Union's nuclear program. This role consisted of hosting nuclear weapon test sites, nuclear-tipped missiles, uranium mining and milling complexes, or tactical nuclear weapons.[51] Many of them suffered negative health and environmental consequences from their association with nuclear weapons, delivery systems, and materials. The countries of Central Asia relinquished their nuclear capabilities after the fall of the Soviet Union and moved toward banning nuclear weapons from their territory. In fact, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan joined together to create a NWFZ through the Treaty of Semipalatinsk. Treaty negotiations began in 1997 and the treaty entered into force in 2009.[52]

In Northeast Asia, Japan pursued a nuclear weapons program during World War II and suffered U.S. nuclear weapons attacks at the end of the war.[53] Another regional power, China, is an NPT-sanctioned nuclear weapon state that carried-out its first nuclear test in 1964. South Korea pursued a nuclear weapons program in the 1970s.[54] Also, the

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[49] Rajesh Basrur, "Low-Profile Deterrence: Lessons from the India Experience," in *Small Nuclear Forces: Five Perspectives*, ed. Malcolm Chalmers, Andrew Somerville, and Andrea Berger, (Royal United Services Institute for Defense and Security Studies, December 2011), 56–57, https://rusi.org/publication/whitehall-reports/small-nuclear-forces-five-perspectives.

[50] Feroz Khan. "Minimum Deterrence: Pakistan's Dilemma," in *Small Nuclear Forces: Five Perspectives*, ed. Malcolm Chalmers, Andrew Somerville, and Andrea Berger, (Royal United Services Institute for Defense and Security Studies, December 2011), 69, https://rusi.org/publication/whitehall-reports/small-nuclear-forces-five-perspectives.

[51] "Nuclear Weapons Test Map," Public Broadcasting Service, accessed December 13, 2014, http://www.pbs.org/wgbh/amex/bomb/maps/.

[52] "Central Asia Nuclear-Weapon-Free-Zone (CANWFZ)," Nuclear Threat Initiative, accessed December 14, 2014, http://www.nti.org/treaties-and-regimes/central-asia-nuclear-weapon-free-zone-canwz/.

[53] Etel Solingen, *Nuclear Logics : Contrasting Paths in East Asia and the Middle East* (Princeton, NJ: Princeton University Press, 2007), 57.

[54] "Profile for South Korea."

disputed territory of Taiwan sought to obtain nuclear weapons in the past.[55] North Korea seems to have had a nuclear capability since the mid-2000s, but it is not an NPT-sanctioned nuclear weapon state.[56] Geopolitically, China appears to be challenging U.S. hegemony, regionally, if not internationally. Tensions periodically flare on the Korean peninsula leading to concerns of a nuclear incident initiated by a nuclear North Korea against a U.S.-backed South Korea. Thus, a rising China, of concern to both Russia and the United States, and U.S. deterrence commitments to Japan and South Korea suggest complex regional nuclear dynamics for the foreseeable future.

In Southeast Asia, Indonesia considered a nuclear weapons program in the 1960s before deciding to join the nonproliferation regime.[57] As members of the Association of Southeast Asian Nations, the countries of Southeast Asia, Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam, joined together to create a NWFZ through the Treaty of Bangkok. It entered into force in 1997. Nevertheless, allegations surfaced in 2010 that Myanmar was secretly pursuing a nuclear weapons program, an accusation that Myanmar vehemently denies.[58]

The South Pacific region holds a unique place in nuclear history due to the nuclear weapons testing conducted in the region by the United States, the United Kingdom, and France.[59] The testing began in 1946 with the United States and continued until early 1996 with France on their respective island territories in the region.[60] Also, Australia served as a nuclear test site for the United Kingdom from the early 1950s to the

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55 "Profile for Taiwan," Nuclear Threat Initiative, accessed April 2, 2017, http://www.nti.org/learn/countries/taiwan/.

56 "Profile for North Korea," Nuclear Threat Initiative, accessed March 22, 2017, http://www.nti.org/learn/countries/north-korea/.

57 "Profile for Indonesia," Nuclear Threat Initiative, accessed April 2, 2017, http://www.nti.org/learn/countries/indonesia/.

58 "Profile for Myanmar," Nuclear Threat Initiative, accessed March 22, 2017, http://www.nti.org/learn/countries/myanmar/.

59 "South Pacific Nuclear-Free Zone (SPNFZ) Treaty of Rarotonga," Nuclear Threat Initiative, accessed December 14, 2014, http://www.nti.org/treaties-and-regimes/south-pacific-nuclear-free-zone-spnfz-treaty-rarotonga/.

60 "South Pacific Nuclear-Free Zone (SPNFZ) Treaty of Rarotonga."

early 1960s.[61] Until the early 1970s, Australia contemplated acquiring nuclear weapons, but decided against this and ratified the NPT in 1973.[62] Ultimately, Australia, the Cook Islands, Fiji, Kiribati, Nauru, New Zealand, Niue, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu established a NWFZ through the Treaty of Rarotonga, which entered into force in 1986.[63]

This overview of regional nuclear histories highlights how these regions have changed over time. Today, some regions are of great concern, such as Northeast Asia, South Asia, and the Middle East. Other regions were a source of angst to the international community in the past, but no longer are. Examples include Latin America when Argentina and Brazil were thought to be developing nuclear weapons programs, Eastern Europe and Central Asia after the fall of the Soviet Union, and Europe at the beginning of the Cold War.

IAEA Director General Mohammad El Baradei acknowledged the importance of regional nuclear dynamics in his remarks on the anniversary of the Treaty of Tlatelolco in 2007. He stated that the treaty "set an important precedent in devaluing the role of nuclear weapons in its zone of application—thereby contributing to regional peace and security."[64] If regional nuclear dynamics could lead to a NWFZ, it would seem that the opposite could also occur. Regional nuclear dynamics could result in an increase in nuclear proliferation. For example, Alagappa notes that "there is no political and security counterpart to economic globalization. Political and security dynamics have become largely regional."[65]

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61 "Profile for Australia," Nuclear Threat Initiative, accessed April 2, 2017, http://www.nti.org/learn/countries/australia/.

62 Ibid.

63 "South Pacific Nuclear-Free Zone (SPNFZ) Treaty of Rarotonga."

64 "Fortieth Anniversary of the Adoption and Opening for Signature of the Treaty for the Prohibition of Nuclear Weapons in Latin America and the Caribbean (Treaty of Tlatelolco)," February 14, 2007, http://www.iaea.org/newscenter/statements/fortieth-anniversary-adoption-and-opening-signature-treaty-prohibition-nuclear.

65 Alagappa, *The Long Shadow*, 13.

Regional-level theories might help us understand why nuclear proliferation trends change over time. What regional-level theories exist to explain nuclear proliferation trends? This third section discusses these theories.

3. Regional-Level Theories

A number of studies on nuclear proliferation have found support for the regional security environment as a proliferation driver. Kurt Campbell et al. conclude that the regional security environment is the primary reason states decide to pursue nuclear weapons.[66] T. V. Paul asserts that a non-great-power state's decision to acquire nuclear weapons "is determined largely by the level and type of security threats that it faces and the nature of interactions or conflict with its key adversaries and allies in its immediate geo-strategic environment."[67] He finds that there is a link between ending regional conflicts and proliferation reversal and, like Campbell, that nuclear choices are related to the regional security environment.[68] In his study on the motivations for nuclear proliferation, Stephen Meyer finds that several variables related to regional rivalry—such as "nuclear threat," "overwhelming conventional threat," and "regional power status/pretensions"—have strong associated nuclear propensities.[69]

Sonali Singh and Christopher Way, in a quantitative study, find that occurrences of rivalry and militarized disputes help explain state motivation to explore nuclear weapons development.[70] Surprisingly, another quantitative study by Dong-Joon Jo and Erik Gartzke concludes that, in terms of motivations, "states facing threats from nuclear powers demonstrate a significantly lower propensity to pursue nuclear programs or

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66 Kurt M. Campbell and Robert J. Einhorn, "Avoiding the Tipping Point: Concluding Observations," in *The Nuclear Tipping Point: Why States Reconsider Their Nuclear Choices*, ed. Kurt M. Campbell, Robert J. Einhorn, and Mitchell B. Reiss (Washington, DC: Brookings Institution Press, 2004), 320.

67 T. V. Paul, *Power versus Prudence : Why Nations Forgo Nuclear Weapons* (Ithaca, N.Y: McGill Queens University Press, 2000), 4.

68 Ibid., 152–53.

69 Stephen M. Meyer, *The Dynamics of Nuclear Proliferation* (Chicago, IL: University of Chicago Press, 1984), 103.

70 Sonali Singh and Christopher R. Way, "The Correlates of Nuclear Proliferation: A Quantitative Test," *The Journal of Conflict Resolution* 48, no. 6 (December 1, 2004): 876, https://doi.org/10.2307/4149798.

weapons proliferation."[71] Scott Sagan attributes this discrepancy to a problem in coding rules between Singh and Way's study and Jo and Gartzke's study.[72] Still, the difference suggests that a correlation between the regional security environment and nuclear proliferation might not always be as straightforward an answer as scholars often suggest. What explains why Egypt never made more progress toward a nuclear weapons program given the regional security challenges it faced?

On the other hand, a number of regional cases do seem to support the variable of regional rivalry. South Asia's nuclear dynamic comes to mind. The security threat from India prompted Pakistan to develop nuclear weapons and to the extent that China plays a role in South Asia's affairs, India's rivalry with China helped drive its decision to pursue nuclear weapons.[73] Other regional conflicts and rivalries where U.S. extended deterrence may hold nuclear proliferation in check include the relationship between China and Japan and between North Korea and South Korea.[74] U.S. security guarantees to non-nuclear-weapon states Japan and South Korea have helped limit nuclear proliferation in these countries.

Another possible explanation lies with regional organizations. What role do they play at the regional level? Do these organizations shape states preferences or do they merely reflect existing interests? Martha Finnemore argues for the former, but Zachary Davis asserts the latter. While both discuss international-level organizations in their respective works, the lessons they draw may apply to regional level organizations as well. Finnemore claims that the norms embodied in international organizations teach states

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[71] Dong-Joon Jo and Erik Gartzke, "Determinants of Nuclear Weapons Proliferation," *Journal of Conflict Resolution* 51, no. 1 (February 1, 2007): 186, https://doi.org/10.1177/0022002706296158.

[72] Scott D. Sagan, "The Causes of Nuclear Weapons Proliferation," *Annual Review of Political Science* 14, no. 1 (2011): 229, https://doi.org/10.1146/annurev-polisci-052209-131042.

[73] Joseph Cirincione, Jon B. Wolfsthal, and Miriam Rajkumar, *Deadly Arsenals: Nuclear, Biological, and Chemical Threats*, Second Edition (Washington, DC: Carnegie Endowment for International Peace, 2005), 222, 240.

[74] Wade L. Huntley, "Rebels without a Cause: North Korea, Iran and the NPT," *International Affairs* 82, no. 4 (July 1, 2006): 305–38, https://doi.org/10.1111/j.1468-2346.2006.00565.x.

what their interests and preferences should be.[75] Davis notes that nuclear regimes, such as the NPT, fill a security need as states pursue their overarching goal of survival in a self-help world.[76] Supporting Davis's argument, it would seem that the North Atlantic Treaty Organization has played a role in satisfying security needs in Europe and stopping European states from creating their own nuclear deterrents.

Do regional organizations even if they are not focused on nuclear issues impact regional nuclear proliferation? Etel Solingen notes that the Arab League has not played any role in stopping nuclear proliferation in the Middle East.[77] The Association of Southeast Asian Nations, however, played a key role in bringing together the Southeast Asian states to create a NWFZ.

What about NWFZs as regional organizations? Do they satisfy a security need by assuring regional states that they do not need to be concerned about nuclear proliferation in their neighborhood? Or does a region already need to be largely pacific in order for its states to come together to create a NWFZ? The answer is not clear. Ultimately, regional organizations appear to have mixed results regarding their impact on nuclear proliferation.

With the recent emphasis in nuclear proliferation literature on examining nuclear proliferation in a regional context, this dissertation will examine T.V. Paul's assertions regarding the nuclear behavior of non-great-power states. How has the regional security environment affected nuclear trends? What role does the security environment play in whether there is an increase or decrease in regional nuclear proliferation?

National-level theories might provide insight into the drivers of nuclear proliferation trends? What national-level theories exist to help explain changes over time? This fourth section discusses these theories.

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[75] Martha Finnemore, *National Interests in International Society* (Ithaca, NY: Cornell University Press, 1996), 3.

[76] Zachary S. Davis, "The Realist Nuclear Regime," *Security Studies* 2, no. 3–4 (June 1, 1993): 79–99, https://doi.org/10.1080/09636419309347520.

[77] Solingen, *Nuclear Logics : Contrasting Paths in East Asia and the Middle East*, 22.

4. National-Level Theories

How do national-level issues impact regional nuclear proliferation? Given that nuclear weapons have thankfully not been used in an attack since 1945, is their power more symbolic if they are used for deterrence purposes or as a measure of prestige or status? Richard Betts writes in a 1977 article that "those states that are emerging as dominant regional power centers with plausible pretensions to being great powers," are most likely to be motivated by status and prestige.[78] If status and prestige figure prominently at the regional level, how do nuclear weapons play a role in a country's identity?

The *Oxford English Dictionary* defines "national identity" as "a sense of a nation as a cohesive whole, as represented by (the maintenance of) distinctive traditions, culture, linguistic or political features, etc." Can nuclear proliferation become a distinct feature of a state's national identity? Can it become a distinct feature of a region? Jacques Hymans in his work on nuclear proliferation psychology defines a concept he calls a "national identity conception," "an individual's sense of *what the nation stands for* and of *how high it naturally stands*, in comparison to others in the international arena."[79] If the right to nuclear enrichment has been engrained in a country's self-image, as has possibly been the case in Iran, how does that affect regional proliferation? If a rejection of all things nuclear has been engrained in a country's self-image, as has perhaps occurred in Kazakhstan, how does that affect regional proliferation? Does national identity have an impact beyond the country it is rooted in? Does it contribute to a regional identity?

Hymans's focus is on the individual level, but Peter Lavoy finds that it is domestic elites that play a critical role in the decision to "go nuclear."[80] Lavoy notes that states are more likely to go nuclear when domestic elites "emphasize the country's

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[78] Richard K. Betts, "Paranoids, Pygmies, Pariahs and Nonproliferation," *Foreign Policy*, no. 26 (1977): 164, https://doi.org/10.2307/1147904.

[79] Jacques E. C. Hymans, *The Psychology of Nuclear Proliferation: Identity, Emotions and Foreign Policy* (Cambridge: Cambridge University Press, 2006), 13.

[80] Peter R. Lavoy, "Nuclear Myths and the Causes of Nuclear Proliferation," *Security Studies* 2, no. 3–4 (June 1, 1993): 192–212, https://doi.org/10.1080/09636419309347524.

insecurity or poor international standing to popularize the myth that nuclear weapons will provide military security and political power."[81] It builds on Jack Snyder's idea that the overexpansion of great powers has roots in "strategic myths and domestic politics."[82] Lavoy's theory links regional competition (i.e., the country's poor international standing) and domestic concerns (i.e., improving military security and political power). Lavoy's argument indicates that domestic elites seek to deceive or manipulate the populace as they push for a nuclear capability. Although, it is possible that domestic elites' beliefs represent a widely held perspective within the broader population and there is domestic support for the nuclear policies that a government pursues. For example, in 2014, Iran's population seemed to be solidly against dismantling half of Iran's centrifuges, a critical part of limiting possible future nuclear proliferation, as part of a nuclear agreement.[83] Further, the idea of an Iranian nuclear capability predates the current regime. Vali Nasr points out that "the Shah thought Iran would need nuclear know-how—just short of an arsenal—in order to emerge as a great power and assert hegemony over its neighborhood. Iran's rulers today may rail against the Shah, but they have bought into his ambitions lock, stock, and barrel."[84]

In addition to the theories of Hymans and Lavoy, what other theories might explain national-level drivers for regional proliferation? In Solingen's work on nuclear proliferation in the Middle East and Northeast Asia, she finds that domestic political actors, specifically liberalizing coalitions, shifted nuclear policy towards more cooperative nuclear postures whereas nationalist-confessional coalitions resisted this shift.[85] Solingen's theory attributes shifts in nuclear policy to specific types of domestic

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[81] Ibid., 199.

[82] Jack L. Snyder, *Myths of Empire: Domestic Politics and International Ambition* (Ithaca, NY: Cornell Univ Press, 1991), 6.

[83] "Iranian Public Ready to Make a Nuclear Deal, but Finds some Demands Unacceptable," University of Maryland, accessed December 17, 2014, https://www.umdrightnow.umd.edu/news/iranian-public-ready-make-nuclear-deal-finds-some-demands-unacceptable.

[84] Vali Nasr, *The Dispensable Nation: American Foreign Policy in Retreat* (New York: Anchor, 2014), 103–4.

[85] Etel Solingen, "The Political Economy of Nuclear Restraint," *International Security* 19, no. 2 (October 1, 1994): 163, https://doi.org/10.2307/2539198.

political coalitions. Like Hymans and Lavoy, she assigns agency on nuclear issues to a country's leadership. She concludes that the trend in Northeast Asia is toward denuclearization while the trend in the Middle East is toward nuclearization.[86] This is counterintuitive given the overall nuclear complexities in Northeast Asia seem to be greater than those in the Middle East.

But while Solingen's work focuses on regional nuclear dynamics, like this dissertation, she investigates internal domestic factors driving nuclear proliferation. This dissertation seeks instead to test the comparative explanatory power of regional and international variables. Thus, her work is not discussed at length in this research project.

Maria Rost Rublee takes a norms-based approach to understanding nuclear proliferation that also focuses on the prominent role of domestic elites. She argues that norms, in the form of the domestic social environment, shape states preferences regarding nuclear weapons.[87] International, regional, and domestic factors create this social environment. She asserts that a state's social environment must be considered in addition to its security environment when seeking the reason why domestic elites decide against pursuing a nuclear weapons program.[88] In Rublee's account, leadership preferences are shaped by norms rather than coalition type or the psychological profile of a leader as in Solingen or Hymans's accounts respectively.

As demonstrated by this review of national-level proliferation theories, this level of analysis provides a rich, detailed account of motivations for nuclear proliferation. The advantage of a detailed account converts to a challenge, however, when integrating national-level analysis with system and regional-level analysis to examine region-wide trends. In light of this challenge, this study will focus on the system and regional-levels of analysis to explain regional nuclear proliferation over time.

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[86] Solingen, *Nuclear Logics : Contrasting Paths in East Asia and the Middle East*.

[87] Maria Rost Rublee, *Nonproliferation Norms: Why States Choose Nuclear Restraint* (Athens, GA: University of Georgia Press, 2009).

[88] Ibid., 221.

Whether the regional trend is toward nuclearization or denuclearization, which variables might best explain regional nuclear dynamics over time? In essence, what drives regional nuclear proliferation trends? This dissertation pursues a possible explanation. It takes a regional approach to the study of nuclear proliferation, defined here as progress toward weapons-relevant nuclear capabilities, by looking at one geographic area, the Middle East. The rationale for choosing this region is discussed in the section on methodology.

5. The Literature on Middle East Nuclear Dynamics

A number of studies have been conducted on nuclear proliferation in the Middle East. A study on Middle East nuclear proliferation from 1992 by Kenneth Timmerman focuses on the international networks that supplied nuclear technology to Iran, Syria, and Libya.[89] While this study highlights the weaknesses of export controls, it does not get at the question of motivations or what drove these countries to set-up the supply networks in the first place. As Steven Meyer notes "nuclear weapons do not generate spontaneously from stockpiles of fissile material."[90] Understanding the motivation to acquire a nuclear weapon is critical.[91]

A study from 1997 by Shay Feldman centers on the future for nuclear arms control in the Middle East with a primary focus on the Arab-Israeli security dynamic prompted by advancement in the Arab-Israeli peace process, the Middle East Arms Control and Regional Security talks, and the unfavorable consequences of nuclear spread in the region.[92] He finds rapid nuclear proliferation unlikely along with the establishment of a NWFZ, absent a comprehensive Arab-Israeli peace agreement.[93] Feldman focuses

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[89] Kenneth R. Timmerman, *Weapons of Mass Destruction: The Cases of Iran, Syria, and Libya* (Los Angeles, CA: Simon Wiesenthal Center, 1992).

[90] Meyer, *The Dynamics of Nuclear Proliferation*, 6.

[91] Ibid.

[92] Feldman, *Nuclear Weapons and Arms Control in the Middle East*, 31.

[93] Ibid., 282.

primarily on the mechanisms for improving arms control efforts in the Middle East rather than regional nuclear trends and what might drive them.

Gawdat Bahgat examines why states in the Middle East have started and stopped pursuing nuclear weapons. He considers "globalization and technological imperative," "leadership/cognitive and psychological approaches," an "internal dynamics and domestic politics model," "national pride and prestige," and security as motivations for pursuing nuclear weapons.[94] Then, he looks at "change in the economic and political orientations," "the international nonproliferation regime," and "U.S. policy" for reasons why states end nuclear pursuits.[95] Bahgat concludes that states make nuclear decisions by continually conducting risk assessments, variables of both supply and demand must be considered, nuclear decisions are made for multiple reasons, and sources of insecurity are varied.[96] This study takes a multi-causal approach to the issue of Middle East nuclear proliferation and the results are specific to each country.

The International Institute for Strategic Studies produced an assessment in 2008 regarding the likelihood for a nuclear cascade in the Middle East given the recent announcements of many Middle Eastern countries to develop nuclear power programs.[97] The study particularly looks at the relationship between Iran's continued nuclear efforts and these announcements. It includes an overview of the region's nuclear programs, capabilities, and nuclear policies along with an assessment regarding what the nuclear renaissance means for the region and broader security interests.[98] Like Timmerman's study, it is primarily focused on supply-side issues related to nuclear proliferation.

Mehran Kamrava's edited volume from 2012 is built around several themes: the impact of domestic political systems, disparate approaches to regional nuclear issues by

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[94] Bahgat, *Proliferation of Nuclear Weapons in the Middle East*, 4–8.

[95] Ibid., 10–14.

[96] Ibid., 17–18; Scott Sagan defines the "supply-side" of proliferation as "the technical capability to develop nuclear weapons" and the "demand-side" of proliferation as "a government's motivation to develop nuclear weapons" in Sagan, "The Causes of Nuclear Weapons Proliferation," 226.

[97] International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran.* (London: International Institute for Strategic Studies, 2008), 7.

[98] Ibid., 13.

outside powers, and the region's nuclear future.[99] The research finds roles for: 1) the nature of a country's relationship with the international community 2) the influence of extra-regional powers and 3) leadership decisions regarding energy needs, threats, status, and hedging.[100] As it is an edited volume, it consists of a collection of essays by experts on Middle East nuclear issues. Contributors include scholars previously mentioned such as Solingen, Rublee, and Bahgat. While the wide spectrum of contributors allow for the application of various theoretical approaches, it does not allow for a cohesive methodological approach to the region.

Another volume, edited by James Russell, looks at the proliferation of weapons of mass destruction in the region, including nuclear weapons.[101] While the contributors do not examine the case studies with a common theoretical lens, they do all consider regional security dynamics, and counterproliferation policy options, and how their findings can inform future policy decision.[102] In addition, this book includes an examination of the proliferation challenge posed by non-state actors with a chapter on the A.Q. Khan network. It concludes with recommendations on how to apply ideas from the Cooperative Threat Reduction program, carried out by the United States, Russia, and the newly independent states after the fall of the Soviet Union, to the region.

The remainder of this chapter is dedicated to outlining the dissertation's research design. This portion includes a discussion of the methodology, case studies, and hypotheses. It continues with an overview of the dissertation's organization with an outline of the chapters and finishes with a concluding section that provides a summary of the dissertation's findings.

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[99] Mehran Kamrava, *The Nuclear Question in the Middle East* (New York: Oxford University Press, 2012), 16–17.

[100] Ibid., 19.

[101] James A. Russell, ed., *Proliferation of Weapons of Mass Destruction in the Middle East: Directions and Policy Options in the New Century*, 2006 Edition (New York: Palgrave Macmillan, 2006).

[102] James A. Russell, "Introduction," in *Proliferation of Weapons of Mass Destruction in the Middle East: Directions and Policy Options in the New Century*, ed. James Russell (New York: Palgrave MacMillan, 2006), 5–6.

B. METHODOLOGY

Rather than studying the region through a series of case studies on individual countries, this dissertation takes the region as the unit of analysis and applies selected variables from two levels of analysis to the region in order to test each variable. The case studies consist of three consecutive time periods that are divided according to structural changes in the international system—a bipolar period, a unipolar period, and a multipolar period. The three periods are from 1973 to 1990, 1991 to 2003, and 2004 to 2013. The first time period is from the timeframe of the 1973 Arab-Israeli War to the end of the Cold War in 1990. Conditions of international bipolarity characterize this time period. The second time period begins with the First Gulf War in 1991 and extends to the Second Gulf War in 2003—a unipolar period following the collapse of the Soviet Union. Finally, the third time period starts after the Second Gulf War in 2004 and extends to the nuclear negotiations between China, France, Germany, Russia, the United Kingdom, and the United States, known as the P5+1, and Iran that began in 2013. In the early 2000s, several changes occurred in military spending that seemed to indicate a possible shift to a multipolar system. Russia began to increase its military expenditures again after experiencing a decrease throughout the 1990s.[103] In addition, China overtook Russia in terms of its military expenditures in the late 1990s.[104] The 2003 Gulf War, which saw few states join the U.S. military coalition, seems to provide a marker for declining U.S. influence and the emergence of a new multipolar system.

The first variable is superpower external management drawn from Kenneth Waltz's theory regarding balance of power and the international system. Waltz argued that, under bipolarity, international involvement and "preponderant power" during the Cold War led to superpower management of regional states.[105] After the Cold War, this level of external management and general system stability came to an end. Referring to unipolarity, Waltz wrote that "unbalanced power leaves weaker states feeling uneasy and

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[103] Stockholm International Peace Research Institute, "Military Expenditure Database," Stockholm International Peace Research Institute, July 2015, https://www.sipri.org/databases/milex/.

[104] Ibid.

[105] Waltz, "The Stability of a Bipolar World," July 1, 1964, 886–88.

gives them reason to strengthen their positions."[106] Further, Waltz assessed that while a multipolar international system was less stable, a unipolar system was least stable.[107] While Waltz did not say what affect a unipolar international system would have on the spread of nuclear weapons, he did predict in 1981 that additional states would gradually obtain them.[108] Non-great power states would be motivated by self-defense, regional competition and rivalry, a cost-savings over conventional weapons, a desire to acquire an offensive capability, and international prestige.[109]

At the systemic level, this dissertation tests the variable of superpower external management based on Waltz's propositions regarding external management and shifts in the international system. External management includes extended deterrence and great-power tradeoffs, which are enabled by the distribution of capabilities.[110]

- Hypothesis 1: Regional nuclear proliferation does not increase during the first time period due to the external management of the region during the Cold War.

- Hypothesis 2: Regional nuclear proliferation could increase during the second time period following the Cold War as a shift to a less stable unipolar international system occurs.

- Hypothesis 3: Regional nuclear proliferation should increase during the third time period as a transition to a multipolar international system occurs and regional powers play more prominent roles.

To test these hypotheses, this dissertation asks the following questions regarding each time period:

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[106] Waltz, "Structural Realism after the Cold War," 29.

[107] Ibid., 30; Waltz, "Evaluating Theories," 915.

[108] Waltz, "The Spread of Nuclear Weapons: More May Be Better."

[109] Ibid.

[110] Kenneth Waltz notes that "great tasks can be accomplished only by agents of great capability" in Waltz, *Theory of International Politics*, 109. Managing nuclear proliferation issues has fallen under the category of "great tasks" that the superpowers and great powers have had to address.

- What broad changes occurred in the international system impacting each time period?
- How did these changes impact the states in the region and their relationship with the superpowers in regards to nuclear issues?
- What evidence is there of superpower control over an increase or decrease in regional proliferation?
- Are there any linkages between changes in the international system and nuclear supply availability?

This variable is deemed critical if recurring nuclear events in the region during the time period demonstrate a causal link between external management and nuclear proliferation trends. For example, does the empirical evidence demonstrate that the relationships of the Soviet Union and the United States with their respective regional allies prevented an increase in regional nuclear proliferation in a bipolar international system?

At the regional level, T.V. Paul provides a useful theory in *Power versus Prudence: Why Nations Forego Nuclear Weapons*.[111] Paul argues that non-great-state powers, such as those states that populate the Middle East, make decisions to obtain nuclear weapons or not based primarily on the regional security environment.[112] Looking at regions, Paul further refines his theory by describing regions as zones of high, moderate, or low conflict.[113] According to Paul, the Middle East is a high-conflict zone, defined as "a high-threat environment characterized by protracted conflicts and enduring rivalries among two or more significant actors in the zone."[114] Thus, states in the Middle East have a high incentive to acquire nuclear weapons.[115] If a state in a high-conflict

[111] Paul, *Power versus Prudence*.

[112] Ibid., 4.

[113] Ibid., 22.

[114] Ibid., 20.

[115] Ibid., 22.

region does not pursue nuclear weapons, it is because of a "countervailing deterrent capability, provided either by an ally or by the state's own capability, such as chemical weapons or conventional superiority, that can somewhat neutralize the nuclear capability of the adversary."[116]

Thus, at the regional level, this dissertation tests the variable of the intensity of regional conflict and rivalry. This variable is taken from Paul's theory regarding proliferation among non-great-power states. A regional rivalry is determined by examining factors such as a state's military and economic role in the region, its pursuit of prestige, and leadership statements regarding rival states.

- Hypothesis 1: Regional nuclear proliferation increases during the first time period due to the intensity of regional conflict and rivalry leading to a high-threat security environment. Proliferation is only mitigated if a state receives security guarantees or finds a different deterrent.

- Hypothesis 2: Regional nuclear proliferation does not increase during the second time period due to a reduction in the intensity of regional conflict and rivalry in the region.

- Hypothesis 3: Regional nuclear proliferation should increase during the third time period due to a resurgence of regional conflict and rivalry. Proliferation is only mitigated if a state receives security guarantees or finds a different deterrent.

To measure this variable, this dissertation asks the following series of questions regarding each time period:

- What was the nature of the regional security environment during each time period? What ongoing conflicts and rivalries were occurring?

[116] Ibid.

- How did the intensity of conflicts and rivalries increase or decrease? Did a rivalry intensify to the point that a state believed that it confronted an existential threat?

- What security guarantees were in place for regional states? Were any other means of deterrence in place that might have replaced the need for a nuclear deterrent?

This variable is deemed critical if recurring nuclear events in the region demonstrate a causal link between regional conflict and rivalry and nuclear proliferation. For example, what role did Syria's rival with regional states play in Syrian nuclear activities in the second time period, such as the construction of the Dayr Al Hajar reactor? Did this variable play a more important role in this time period? A distinguishing characteristic between whether the driver for nuclear proliferation was external management or regional conflict and rivalry was multiple states driving the security environment rather than the presence or absence of superpower management.

The heart of the dissertation research consists of three, consecutive time periods, which together span forty years of modern Middle East history. The study examines the time periods using the sets of questions centered on the two variables previously elaborated on. The time periods span the bipolar system of the Cold War to the unipolar system that emerged after the fall of the Soviet Union to a multipolar system as other states more readily challenge U.S. hegemony. During these periods, progress towards nuclear weapons—fissile material, nuclear warheads, or delivery systems—is examined. To determine whether progress was made, I weigh state-level nuclear behavior and acquisition activities along with leadership pronouncements.

Among various world regions, the Middle East region serves as a good unit of analysis for several reasons. First, high levels of conflict and rivalry characterize the region making it a likely candidate for observing the effects of the regional security environment on nuclear proliferation trends. Second, throughout the structural changes that have occurred in the international system since the beginning of the nuclear age, bipolarity to unipolarity to multipolarity, superpowers and great powers have been

involved deeply in the region. Thus, history provides numerous examples of regional efforts by external managers.

Of note, this dissertation focuses on the Middle East region bounded by Libya to the west, Iran to the east, Turkey to the north, and Yemen to the south. While Libya is often included with North Africa rather than the Middle East, the dynamics surrounding its nuclear program seem to be more closely linked to the Middle East region. For example, one of Muamar Qaddafi's stated motivations for pursuing a nuclear weapons program was to further his leadership in the Arab world. The Middle Eastern countries studied were Egypt, Iran, Iraq, Libya, Saudi Arabia, Syria, Turkey, and the United Arab Emirates. Finally, various academics such as Ethel Solingen, Gawdat Bahgat, Shyam Bhatia, and Avner Cohen have written on the topic of Israel's possible pursuit of nuclear weapons in the 1960s.[117] As the time period of the 1960s is not a part of any of the three time periods that are the focus of this dissertation, this material is not reviewed here.

Choosing these three time periods in Middle East nuclear history as case studies, allows for the study to test how the regional nuclear environment changed as the structure of the international system changed along with the role of the two proposed variables in each case study. Thus, it seeks to critique two theories of proliferation rather than create a theory of proliferation. This approach to analyzing nuclear dynamics in the Middle East can be characterized as a theory-testing dissertation, an ideal-type proposed by Steven Van Evera.[118]

While this dissertation focuses on theory-testing, in terms of the advantages of this kind of qualitative study using a series of case studies, Alexander George and Andrew Bennett note that case studies are especially useful for theory development and testing hypotheses due to "their potential for achieving high conceptual validity; their strong procedures for fostering new hypotheses; their value as a means to closely

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[117] Solingen, *Nuclear Logics : Contrasting Paths in East Asia and the Middle East*; Bahgat, *Proliferation of Nuclear Weapons in the Middle East*; Shyam Bhatia, *Nuclear Rivals in the Middle East* (New York: Routledge, Kegan, and Paul, 1988); Avner Cohen, *Israel and the Bomb* (New York: Columbia University Press, 1999).

[118] Stephen Van Evera, *Guide to Methods for Students of Political Science* (Ithaca, NY: Cornell University Press, 1997).

examine the hypothesized role of causal mechanisms in the context of individual cases; and their capacity for addressing causal complexity."[119]

The three cases chosen demonstrate the range of variation at the systemic level since the beginning of the nuclear age—bipolarity, unipolarity, and multipolarity. John Gerring describes this technique of case selection as a "diverse" case selection and notes that it is helpful for hypothesis testing.[120] He states that this approach benefits a research project by "introducing variation on the key variables of interest."[121]

The dissertation's case studies are constructed using primary and secondary sources on the topic of Middle East security and nuclear proliferation. The secondary sources primarily consist of academic and published authoritative works. As suitable, primary sources from unclassified or declassified documents and reports in U.S. national security academic collections are utilized. Thus, the case studies are constructed and subsequent judgments made based on information available in the unclassified realm. In addition, it is important to note the impossibility of complete certainty regarding the motivations to pursue nuclear weapons. This is especially the case in the Middle East given the lack of government transparency. Quotes from foreign leaders are included in the narrative to help shed light on their thinking regarding nuclear issues. Nevertheless, extensive unclassified and declassified studies and analyses produced by the U.S. government over time regarding the Middle East region help compensate for this knowledge gap.

C. OVERVIEW OF RESEARCH PROJECT

This dissertation is organized as follows. This first chapter has provided an overview of scholarly works relevant to the study of regional nuclear proliferation and has compared nuclear trends in world regions. It then transitions to a discussion of the

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[119] Alexander L. George and Andrew Bennett, *Case Studies and Theory Development in the Social Sciences*, Fourth Printing Edition (Cambridge, MA: MIT Press, 2005), 19.

[120] John Gerring, *Case Study Research: Principles and Practices*, First Edition (New York: Cambridge University Press, 2006), 89.

[121] Ibid., 100.

research project's methodology and an overview of how the study will proceed. The second, third, and fourth chapters consist of the three case studies spanning a total of forty years in recent Middle East history. The two selected variables are applied to each time period. The second chapter focuses on the bipolar era of the Cold War from 1973 to 1990. The third chapter focuses on the so-called unipolar period when the United States was the largely uncontested global hegemon. This period spans 1991 through 2003. The fourth chapter covers the multipolar era from 2004 to 2013.

The fifth chapter compares the case studies in order to assess the relative weight of the variables over time. It includes a discussion of how the findings might be applied to other regions. The concluding chapter examines possible future regional proliferation trends before turning to future research opportunities.

D. CONCLUSION

This theory-testing dissertation seeks to contribute to the literature on nuclear proliferation in the Middle East and in a regional context. Its goal is to shed light on what drives nuclear proliferation dynamics over time in a region as a whole. Specifically, it asks if one theory can account for variations over time in the Middle East and if one theory can explain specific periods better than another.

Given the level of conflict and rivalry in the Middle East, I expected to find the regional security environment driving nuclear proliferation trends over time. Through this research, I discovered how important external managers are in driving regional nuclear trends. The United States as a superpower played a critical role in the bipolar period seeking to enforce and close loopholes in a nonproliferation regime that included the NPT, the IAEA, and other multilateral regimes. Nevertheless, it often fell short and the region saw a shift toward increased nuclear proliferation driven by the regional security environment.

The structural shift to a unipolar system gave the United States, the global hegemon, more operational space to reinforce and strengthen the nonproliferation regime.

Nonproliferation efforts were more effective in the unipolar period than the bipolar period leading to a regional decrease in nuclear proliferation.[122]

A nonproliferation regime strengthened during the unipolar period continued to influence nuclear proliferation trends in the multipolar period resulting in a further decrease in regional proliferation. In addition, the multipolar period saw the beginnings of post-hegemonic cooperation as described by Keohane in *After Hegemony*.

[122] This dissertation treats counterproliferation efforts as a subset of nonproliferation efforts.

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II. COMPETING NUCLEAR AMBITIONS IN THE MIDDLE EAST: 1973–1990

During the bipolar period, a time of increased stability in the international system, my international level hypothesis forecast a decrease in nuclear proliferation, defined as progress toward weapons-relevant nuclear capabilities. The regional level hypothesis predicted an increase in nuclear proliferation during this time of heightened conflict and rivalry in the region. I discovered that nuclear proliferation did increase during this time period.

Kenneth Waltz, on one hand, would predict that with stability in the international system during the bipolar period and superpower efforts to control their client states in the region, nuclear proliferation should decrease. On the other hand, T.V. Paul would assert that nuclear proliferation should increase driven by the tumultuous regional security environment. While Egyptian efforts to acquire a nuclear arsenal diminished, nuclear proliferation in the region increased overall because Iran, Iraq, Libya, and Saudi Arabia made progress toward weapons-relevant nuclear capabilities. This overall increase in regional proliferation behavior occurred within the context of a bipolar international system, which contradicts conventional wisdom. Even though there should have been a good deal of superpower management in a bipolar setting, there was enough wiggle room for regional states that wished to pursue nuclear weapons to do so. The evidence presented here shows that the superpowers had little control over whether their client states decided to proliferate. These regional actors were free to make their own calculations regarding nuclear proliferation independently. Regional conflict and rivalry, rather than Cold War dynamics or superpower influence, probably played a determining role in the regional trend toward increased nuclear proliferation.

This first chapter spans the time period of 1973 through 1990. The period's beginning is marked by the near nuclear crisis between the United States and the Soviet Union during the 1973 Arab-Israeli War. The conclusion of the Cold War marks the period's end.

This chapter is divided into two sections. The first section tells the history of the states that have attempted or might have made an attempt from 1973 through 1990 to acquire nuclear weapons. The states that figure prominently in this history are Egypt, Iran, Iraq, Libya, Saudi Arabia, Syria, Turkey, and the United Arab Emirates. This section describes the domestic political setting for each country to provide context for each country's nuclear decision-making. Because the three major elements of a nuclear program are fissile material, a delivery system, and a nuclear warhead, the chapter focuses on national efforts to build these nuclear components.[123]

The second section uses ideas from Kenneth Waltz's *Theory of International Politics* to assess the degree to which the superpowers acted as international managers, constraining the nuclear ambitions of regional states. It also incorporates the competing hypothesis of regional security dynamics described by T.V. Paul, which suggests that regional actors respond to regional threats, not superpower preferences, when it comes to their proliferation policies. This chapter will identify and evaluate the factors that drove regional nuclear behavior throughout the time period.[124]

A. REGIONAL NUCLEAR HISTORY

During this time period, the United States and the Soviet Union were immersed in the Cold War. In fact, the superpowers nearly came into conflict as the United States escalated its defense posture during the 1973 Arab-Israeli War, placing U.S. nuclear forces on alert. At that time, Egypt, Iraq, and Libya were client states of the Soviet Union and Iran was a client state of the United States. By the mid- to late 1980s, the United States had a better relationship with Egypt and Iraq and a difficult relationship with Iran.

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[123] Paul K. Kerr, Steven A. Hildreth, and Mary Beth D Nikitin, "Iran-North Korea-Syria Ballistic Missile and Nuclear Cooperation" (Washington, DC: Library of Congress, Congressional Research Service, May 11, 2015), 1–2, https://www.fas.org/sgp/crs/nuke/R43480.pdf.

[124] This chapter uses primary source material from the Digital National Security Archives, the *Foreign Relations of the United States* series published by the U.S. Department of State, the National Security Archive at George Washington University, the Declassified Documents Reference System, and the Central Intelligence Agency's Freedom of Information Electronic Reading Room. Secondary sources mainly consist of books and journal articles on nuclear proliferation, international relations, and strategic studies. This chapter also uses data compiled by the Correlates of War Project and the International Monetary Fund.

Nevertheless, Iran, Iraq, and Libya all pursued nuclear weapons programs during this period.

On the systemic level, what was the impact of Cold War relations on nuclear proliferation in the Middle East? What does the historical record say about how the superpowers viewed their respective interests and roles in the region in regard to nuclear proliferation? How much leverage did they have over the acquisition of nuclear capabilities by Middle Eastern states? How did the superpowers function as external managers?

On a regional level, security tensions characterized the relationships between many of the states in the Middle East. Iran and Saudi Arabia strove for regional hegemony in the early 1970s after the exit of Great Britain from the Persian Gulf region. The British announced their withdrawal in 1968, motivated by a desire to save resources and to promote internal political reform for the Gulf States, and concluded their effort by the end of 1971.[125]

Egypt and Syria attacked Israel in 1973. Israel struggled with its neighbors for recognition as a state and for territory. Syria and Iran interfered in Lebanon's civil war that stretched from 1975 until the end of the 1980s. Iraq attacked Iran in 1980 beginning a nearly decade-long, bloody war between the two countries. Egypt, Iraq, Libya, Saudi Arabia, and Syria strove to be recognized as leaders in the Arab world, if not the Middle East writ large. Iran and Turkey sought a leadership role in the Middle East.

What was the impact of these rivalries on the Middle East? How did these states view their interests and roles in regard to nuclear proliferation? What drove nuclear proliferation in the region? What part did regional conflict and rivalry play in the pursuit of nuclear capabilities?

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[125] R. P. Owen, "The British Withdrawal from the Persian Gulf," *The World Today* 28, no. 2 (1972): 76.

1. Egypt

Egypt began the time period locked in conflict with its regional rival Israel. Egypt's loss to Israel in the 1973 Arab-Israeli War and the subsequent 1979 peace agreement resulted in a reduction of tensions and a shift in the country's nuclear efforts. By the early 1980s, Egypt was focusing on civilian applications for its nuclear program. Nevertheless, it continued to build its ballistic missile capabilities.

a. Political Context

Egypt saw itself as a major player in the Arab world, if not the leader of the Arab states from the 1950s through the 1970s. At the height of its Pan-Arab leadership under President Gamal Abdel Nasser from 1956 to 1970, Egypt and Syria joined briefly to become the United Arab Republic from 1958 to 1961. Nasser pushed forward his brand of socialist, Arab-nationalist thinking, which came to be known as Nasserism. He nationalized various Egyptian assets and began major public works such as the Aswan High Dam.

During this time, a strong rivalry ensued between Egypt and Israel. The two countries fought wars in 1948, 1956, 1967, and 1973. Although, the 1973 war caused a sea change in Egypt's approach to its rivalry with Israel. Egypt and Syria attacked Israel on October 6, 1973, in an effort to regain land lost in the 1967 Arab-Israeli War. After the tide of the 1973 war turned against Egypt, it sought assistance from its superpower ally, the Soviet Union, and Israel turned to its superpower ally, the United States.[126] The situation between the Soviet Union and the United States escalated to the point that on October 25, as Richard Ned Lebow and Janice Gross Stein noted, the United States put its nuclear forces on alert at the level of DEFCON III.[127] After a tense standoff, the crisis was resolved that same day between all four parties through adoption of United Nations

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[126] U.S. Department of State, Office of the Historian, "The 1973 Arab-Israeli War," Milestones: 1969–1976, accessed December 20, 2017, https://history.state.gov/milestones/1969-1976/arab-israeli-war-1973.

[127] Richard Ned Lebow and Janice Gross Stein, "Deterrence and the Cold War," *Political Science Quarterly* 110, no. 2 (1995): 165, https://doi.org/10.2307/2152358.

(UN) Security Council resolution 340, but it had brought the two superpowers to the brink of a nuclear confrontation.[128]

This period of history provides insight into the level of control leveraged by the superpowers over their client states. How did the superpowers get into the conflict in the first place? Yevgeny Primakov, a Soviet Middle East expert at the time, recalled this incident and complained that "it is often said that the two sides in the Middle East conflict were caught in the vicelike grip of the two superpowers. It was, however, the other way around. Neither the United States nor the Soviet Union had any decisive means to control the course of events; both found themselves at the mercy of an escalating crisis in the region."[129] From the American perspective, a U.S. National Intelligence Estimate from March 1970 summarized the dynamic between Cairo and Moscow: "In the last analysis, [the Soviets] cannot control Cairo's behavior on questions the Egyptians consider vital."[130] In May 1973, the U.S. State Department surmised that Egyptian President Anwar Sadat believed that initiating hostilities would force the superpowers to intervene, thereby ending the negotiating stalemate with Israel over Egypt's territories lost in the 1967 Arab-Israeli War.[131] The client states seemed to draw the superpowers into acting on their behalf.

Egypt experienced significant losses during the 1973 Arab-Israeli War and decided to come to the peace table, but the rest of the Arab world strongly opposed Egypt making peace with Israel. In 1978, the United States led Egypt and Israel to participate in the Camp David Accords and to sign a historic peace agreement in 1979. The Arab states argued, however, that negotiations should have occurred in a regional, multilateral context rather than a bilateral one. Syria's president Hafez al-Assad stated that "Sadat, by

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[128] U.S. Department of State, Office of the Historian, "The 1973 Arab-Israeli War."

[129] Yevgeny Primakov, *Russia and the Arabs: Behind the Scenes in the Middle East from the Cold War to the Present* (New York: Basic Books, 2009), 155.

[130] Erin R. Mahan, ed., *Foreign Relations of the United States, 1969–1976*, vol. XII, Soviet Union, January 1969-October 1970 (Washington, DC: Government Printing Office, 2006), Document 138.

[131] U.S. Department of State, Ray S. Cline, Assistant Secretary of State for Intelligence and Research, "Growing Risk of Egyptian Resumption of Hostilities With Israel," May 31, 1973, 2, http://nsarchive.gwu.edu/NSAEBB/NSAEBB415/docs/doc%201%2031MAY1973_INR_RAYCLINE(3).pdf.

journeying to Israel, had recognized Israel and a unified Jerusalem as its capital, had broken Arab solidarity, and had dealt separately on regional affairs he had no right to discuss with the Israelis on his own."[132] In retaliation, Egypt's membership in the Arab League was terminated and the Arab states cut diplomatic ties with Egypt. Egypt lost its political stature as a regional leader and countries such as Iraq, Libya, and Syria looked for ways to fill the political vacuum.

Nevertheless, Egypt undoubtedly gained from the peace deal. Egypt expert Robert Einhorn noted that to offset economic retribution by the Arab states, the United States committed to significant financial assistance for Egypt as part of the peace agreement.[133] Egypt also gained exponentially in terms of increased political and military ties with the United States. The agreement resulted in a stronger bilateral relationship between Egypt and the United States.[134] This U.S. assistance provided a strategic boost to Egypt as Sadat worked to open up the country through economic and political reforms, undoing some of Nasser's socialist political efforts.

b. Nuclear Program

The origin of Egypt's nuclear efforts, like that of many regional states, was in the "Atoms for Peace" program. Egypt's nuclear program was initiated by U.S. President Dwight D. Eisenhower following his 1953 speech to the UN General Assembly on the use of nuclear technology for peace and development.[135] The Egyptians embraced nuclear technology and established the Egyptian Atomic Energy Commission in 1955.[136]

Through the lens of Pan-Arabism, Egypt seemed to view expertise in and acquisition of nuclear technology as part of the trappings of regional leadership and

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[132] "Assad Tells Interviewer Sadat's Gesture to Israel 'Destroyed' Peace Effort," *New York Times*, January 9, 1978, A7.

[133] Robert J. Einhorn, "Egypt," in *The Nuclear Tipping Point: Why States Reconsider Their Nuclear Choices*, ed. Kurt M. Campbell, Robert J. Einhorn, and Mitchell B. Reiss (Washington, DC: Brookings Institution Press, 2004), 49.

[134] Ibid., 48.

[135] "Profile for Egypt—Nuclear," Nuclear Threat Initiative, accessed August 8, 2017, http://www.nti.org/learn/countries/egypt/nuclear/.

[136] Ibid.

pursued a civilian nuclear program while keeping open the option for a military program. Furthermore, Egypt appeared to be motivated by its regional rivalry with Israel. For example, according to the *New York Times*, Nasser commented in 1960, in regards to his assessment about a possible Israeli nuclear program that "this will be the beginning of war between us and Israel."[137]

The Soviet Union supplied Egypt's first reactor, the Experimental Training Research Reactor Number One light water reactor, and its fuel load of 3.2 kilograms of ten percent enriched uranium.[138] Construction began on the research reactor at Inshas in 1958 and it went critical in 1961.[139] The small amount of plutonium generated by the reactor did not seem to pose a proliferation concern and the facility was subject to International Atomic Energy Agency (IAEA) safeguards beginning in 1981.[140]

The program entered its most active phase in the early 1960s. According to Einhorn, in this time period, the country "boosted its budget for nuclear programs, stepped up its efforts to recruit and train nuclear scientists, approached a wide range of countries for assistance, examined prospects for mining thorium and uranium in Egypt, and explored elements of the nuclear fuel cycle that could eventually enable it to produce fissile material."[141] For example, the International Institute for Strategic Studies wrote that Egyptian Atomic Energy Commission head, Salah Hedayat, sought to acquire heavy-water reactors capable of producing plutonium.[142] In addition, Barbara Gregory noted that Egypt sought nuclear technology transfers from the Soviet Union, China, and India

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137 "Nasser Threatens Israel on A-Bomb," *New York Times*, 1.

138 Research Reactor Database, International Atomic Energy Agency, accessed July 27, 2015, https://nucleus.iaea.org/RRDB/RR/ReactorSearch.aspx?rf=1; Barbara M. Gregory, "Egypt's Nuclear Program: Assessing Supplier-Based and Other Developmental Constraints," *Nonproliferation Review* 3, no. 1 (Fall 1995): 22.

139 Research Reactor Database.

140 Gregory, "Egypt's Nuclear Program: Assessing Supplier-Based and Other Developmental Constraints," 22.

141 Einhorn, "Egypt," 45–46.

142 International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran*, 19.

from the mid-1960s to the mid-1970s, although these supplier countries did not provide assistance.[143]

Despite Egypt's efforts, the country did not acquire a nuclear weapon. James Walsh found that while Egypt worked to acquire nuclear weapons in the 1950s and 1960s, it did not commit the resources achieving this goal would have required.[144] Nasser never created a budget dedicated to advancing Egypt's nuclear weapons efforts.[145] Walsh quoted Nasser confidante Hassan El-Badri: "According to Badri, the Egyptian President concluded that Egypt could go nuclear, but only 'if the national budget is cut in half to devote to the bomb.' Badri believed that Nasser wanted nuclear weapons, but was unwilling to inflict further economic hardship on his people."[146] It seemed that in Nasser's cost-benefit analysis of the country's nuclear program, the program was too costly.

Egypt appeared to turn away from a military nuclear program more definitively in the 1970s. Egypt's defeat by Israel in 1973 left it further humiliated but also realistic about its chances of reclaiming territory lost in the 1967 conflict. As Egypt sought to make peace with Israel, it made concessions on its nuclear program. Maria Rost Rublee assessed that Sadat used Egypt's nuclear program as a bargaining tool with the United States; he promised to ratify the Nuclear Nonproliferation Treaty (NPT) that Egypt signed in 1968 and relinquish the country's nuclear weapons goal.[147] In 1974, Egypt, with Iran's support, put forth a plan for a nuclear-weapon-free zone (NWFZ) in the Middle East. This proposal was the first of its kind in the region.

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[143] Gregory, "Egypt's Nuclear Program: Assessing Supplier-Based and Other Developmental Constraints," 21.

[144] James Walsh, "Bombs Unbuilt: Power, Ideas and Institutions in International Politics" (Massachusetts Institute of Technology, 2001), 172, http://dspace.mit.edu/handle/1721.1/8237.

[145] International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran*, 19.

[146] Walsh, "Bombs Unbuilt: Power, Ideas and Institutions in International Politics," 174.

[147] Maria Rost Rublee, "Egypt's Nuclear Weapons Program," *Nonproliferation Review* 13, no. 3 (2006): 556, https://doi.org/10.1080/10736700601071637.

President Sadat began to take steps to build Egypt's nuclear power program in the mid-1970s. First, U.S. President Richard M. Nixon and Sadat signed a bilateral cooperation agreement between the two countries in 1974.[148] It specified future nuclear cooperation negotiations after which the United States would provide eight reactors and fuel to build Egypt's nuclear energy program.[149] Sadat established Egypt's Nuclear Power Plants Authority in 1976. Egypt continued efforts to establish a nuclear energy program in the 1980s, but it was not successful in acquiring a nuclear power reactor.[150] Egypt ratified the NPT and the IAEA Comprehensive Safeguards Agreement in 1981.[151] These actions permitted Egypt to receive help from the IAEA for nuclear power and moved it further away from nuclear weapons development.[152] In 1981, Egypt signed nuclear agreements with the United States and West Germany seeking to acquire nuclear power reactors, but Egypt was unsuccessful at obtaining the reactors.[153] In fact, during the 1970s and 1980s, Egypt made numerous attempts to set up a nuclear power infrastructure, but agreements for power reactors ultimately fell through or were cancelled.[154]

In addition to Egypt's work to establish a nuclear power program, the country pursued the acquisition of nuclear technology. In the early 1980s, Egypt established a nuclear waste management facility and a hot cell complex at Inshas, according to the International Institute for Strategic Studies.[155] Gregory noted that there was periodic reporting on Egyptian efforts to mine uranium domestically throughout the 1980s and

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148 "Profile for Egypt—Nuclear."

149 "Text of Nixon-Sadat Statement," *New York Times*, June 15, 1974, http://www.nytimes.com/1974/06/15/archives/text-of-nixonsadat-statement-i-general-principles-of-bilateral.html; Gregory, "Egypt's Nuclear Program: Assessing Supplier-Based and Other Developmental Constraints," 21.

150 "Profile for Egypt—Nuclear."

151 Ibid.

152 International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran*, 22.

153 Ibid., 21.

154 Ibid.

155 Ibid.

Egypt acquired a fuel fabrication facility in the late 1980s.[156] Shay Feldman highlighted that, through 1986, Egypt held multiple nuclear conferences and training events, boasted about 500 nuclear technicians working in-country, and churned out graduate students in the nuclear sciences.[157] According to Gregory, these pursuits gave the appearance that Egypt was seeking to develop expertise on the nuclear fuel cycle even if it was not pursuing a nuclear weapon outright.[158] They likewise supported an image of Egypt as a leader in the Arab world.

The 1986 Chernobyl nuclear disaster dampened Egyptian interest in nuclear power. In 1992, when asked about nuclear power plants, Egyptian President Hosni Mubarak stated, "If we set up a network of three or four stations, we would start with $2 billion, but this figure would reach $5-6 billion by the time it was finished; that is, the final figure would be between $18-20 billion."[159] Economic concerns about the cost of building up Egypt's nuclear infrastructure began to cast a shadow on the country's nuclear energy plans.

Finally, in 1990, Egypt expanded its position from calling for the region to be free from nuclear weapons to calling for the region to be free of weapons of mass destruction. In November 1990, Nabil Fahmy, an Egyptian diplomat posted to the UN in New York, cited the region's ongoing conflicts as a rationale for the Egyptian proposal. He highlighted the Arab-Israeli conflict, the Iraq-Iran conflict, and Iraq's recent occupation of Kuwait.[160] A subsequent UN NPT Review Conference called for a weapons-of-mass-

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156 Gregory, "Egypt's Nuclear Program: Assessing Supplier-Based and Other Developmental Constraints," 23.

157 Feldman, *Nuclear Weapons and Arms Control in the Middle East*, 60.

158 Gregory, "Egypt's Nuclear Program: Assessing Supplier-Based and Other Developmental Constraints," 22.

159 Hosni Mubarak, interview on ESC Television (Cairo), July 19, 1992; cited in Gregory, "Egypt's Nuclear Program," 25.

160 Mohamed Nabil Fahmy, "Egypt's Disarmament Initiative," *Bulletin of the Atomic Scientists* 46, no. 9 (1990): 9, https://doi.org/10.1080/00963402.1990.11459898.

destruction free zone in the region.[161] The proposed region would stretch from "Libya in the west, to Iran in the east, and from Syria in the north to Yemen in the south."[162] Discussions of allowed delivery systems in the region and the verification process for enforcing such a treaty were not finalized.[163] Nevertheless, Egypt continued to play a role with the UN and the IAEA to advance a NWFZ and a weapons–of-mass-destruction free zone in the Middle East.[164]

In tandem with Egypt's nuclear efforts, the country pursued a ballistic missile capability beginning in the 1950s. Joseph Bermudez asserted that the goal of this program was the indigenous development of ballistic missiles and a satellite launch vehicle.[165] He concluded, however, that the program never produced the desired missiles due to technical and program management issues.[166] According to the Nuclear Threat Initiative, in the early 1970s, the Soviet Union agreed to supply Egypt with short-range ballistic missiles, Scud-B missiles.[167] Bermudez further noted that, in the early 1980s, Egypt entered into a partnership with North Korea to produce a Scud-B missile indigenously.[168]

Egypt's effort to acquire a medium-range ballistic missile capability began in 1984 with an agreement with Argentina for the Condor II project.[169] Bermudez assessed

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161 "The 1995 NPT Review Conference Resolution on the Middle East" (New York: United Nations Office for Disarmament Affairs), accessed January 13, 2016, http://www.un.org/disarmament/WMD/Nuclear/1995-NPT/pdf/Resolution_MiddleEast.pdf.

162 "WMD-Free Middle East Proposal at a Glance," Arms Control Association, accessed May 24, 2016, https://www.armscontrol.org/factsheets/mewmdfz.

163 Ibid.

164 Ibid.

165 Joseph S. Bermudez Jr, "Ballistic Missile Development in Egypt," *Jane's Intelligence Review* 4, no. 19 (1992): 452.

166 Ibid.

167 "Profile for Egypt—Missile," Nuclear Threat Initiative, accessed November 21, 2016, http://www.nti.org/learn/countries/egypt/delivery-systems/.

168 Bermudez Jr, "Ballistic Missile Development in Egypt," 453.

169 Ballistic missiles are generally categorized as short-range with a range of 1,000 km or less, medium-range with a range of 1,000 to 3,000 km, intermediate-range with a range of 3,000 to 5,500 km, and intercontinental ballistic missiles with a range of over 5,500 km. Please see, "Worldwide Ballistic Missile Inventories," Arms Control Association, July 2014, https://www.armscontrol.org/factsheets/missiles.

that the effort was spurred by a desire to improve Egypt's military capability after the 1973 Arab-Israeli War and Libya's similar effort to obtain and produce ballistic missiles.[170] Egypt had also taken note of how Iraq used its missile capabilities to gain a cease-fire favorable to its interests during the Iran-Iraq War.[171] Egypt and Iraq both signed an agreement with Argentina for this ballistic missile development project, but under pressure from the West, the cooperation ended before the end of the decade without either country acquiring the missile capability, according to Bermudez.[172] Notably, once the Missile Technology Control Regime, a U.S.-initiated institution, was established, the Condor II project was one of its first targets.[173] Nevertheless, Bermudez surmised that the project did leave Egypt with significant expertise in missile technology.[174]

c. Nuclear Trends

Egypt may have been eager to obtain nuclear weapons capability in the 1960s and perhaps in the early 1970s, by 1981, its focus had switched to nuclear power and the country had joined the nonproliferation regime. After the 1973 war and the 1979 peace agreement, Egypt did not seem to make the pursuit of nuclear weapons a priority. In fact, Leonard Spector wrote in 1990 that, since 1981, "Egypt's nuclear intentions have appeared to be entirely peaceful."[175] Nevertheless, given Egypt's nuclear infrastructure, the country would likely be able to create a weapon if it acquired fissile material, according to Frank Barnaby.[176] Egypt did, however, appear to augment its short-range

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[170] Bermudez Jr, "Ballistic Missile Development in Egypt," 455.

[171] Gawdat Bahgat, "Nuclear Proliferation: Egypt," *Middle Eastern Studies* 43, no. 3 (2007): 411, https://doi.org/10.1080/00263200701246074.

[172] Bermudez Jr, "Ballistic Missile Development in Egypt."

[173] "Profile for Egypt—Missile."

[174] Bermudez Jr, "Ballistic Missile Development in Egypt," 458.

[175] Leonard S. Spector, *Nuclear Ambitions: The Spread of Nuclear Weapons* (Boulder, CO: Westview Press, 1990), 144.

[176] Frank Barnaby, *The Invisible Bomb: The Nuclear Arms Race in the Middle East* (London: St. Martin's Press, 1990), 83.

ballistic missile arsenal. The country also undertook a serious effort to acquire medium-range ballistic missiles with the Condor II program.

What drove Egypt's nuclear behavior? Looking at the regional context, Egypt's rivalry with Israel appeared to drive its security policy. The country seemed to be motivated to pursue nuclear weapons due to this rivalry with a neighboring state, but Egypt's nuclear efforts drew to an end in the 1970s. The historical account suggests that a large reason for Egypt deciding to forfeit its nuclear ambitions was pressure from the United States following the 1973 Arab-Israeli War. This would indicate that superpower external management played a key role in ending Egypt's drive for nuclear weapons. Further, it seems probable that Egypt might have obtained medium-range ballistic missiles through the Condor II program if not for the constraining effects of U.S. pressure and the Missile Technology Control Regime.

2. Iran

Iran sought to assert itself as a regional hegemon following the exit of the British from the Persian Gulf, vying with Saudi Arabia for the role. Domestic turmoil rocked the country, however, with its 1979 revolution. An anti-Western government came to power and began to export its Islamic revolution in the region. Revolutionary activities included supporting Shia militants, namely Hezbollah, in the Levant.[177] The Iran-Iraq War, which posed an existential threat to Iran, began in 1980 and ended in 1988.

Iran, led by Mohammad Reza Shah Pahlavi, began the time period seeking to build its nuclear capability while publicly disavowing interest in a nuclear weapons program. After the country's 1979 revolution, the nuclear program, associated by the new leadership with Western influence, was swept aside. The threat posed by Iraq during the Iran-Iraq War, however, led to a more pragmatic view of nuclear weapons capabilities. The program was restarted in the early 1980s, with a military focus, and Iran continued to build its nuclear weapons capability throughout the time period. The war also

[177] Augustus Richard Norton, *Hezbollah: A Short History* (Princeton, NJ: Princeton University Press, 2007), 34.

demonstrated to Iran the importance of ballistic missiles. China and North Korea worked with Iran to advance its missile program.

a. Political Context

The Shah envisioned his country as the regional hegemon following the British withdrawal from the Persian Gulf in 1968. The Shah believed Iran should assume the role of the "guardian in the Persian Gulf region" and pursued U.S. support for this role.[178] Furthermore, Iran enjoyed close ties with the United States and the country was an eager consumer of U.S. military equipment and technology. By 1970, the United States had formulated a "twin pillars" strategy whereby it would rely on both Iran and Saudi Arabia to facilitate regional stability.[179] In fact, throughout the 1970s and 1980s, Iran was a regional leader in gross domestic product output and defense spending along with Saudi Arabia. Privately, however, at that time, the U.S. Department of State acknowledged Iran's regional dominance and assessed that Iran would emerge as the strongest power.[180]

Comments by the Shah at a 1975 meeting with U.S. President Gerald R. Ford illustrated how Iran saw its regional position. The Shah noted good relations between Iran and Israel, Egypt, and Saudi Arabia and stated that Iran had resolved its differences with Iraq.[181] He opined that Saudi Arabia's military was not very good.[182] He dismissed Libya as unimportant and referred to Libyan President Muammar Qadaffi as "a nut" who

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178 U.S. Department of State, "The Evolution of the U.S.-Iranian Relationship: A Brief Overview of the U.S.-Iranian Relationship 1941–1979," 1980, 15, 1679060847; IR03555, Digital National Security Archive; U.S. Department of State, Bureau of Near Eastern and South Asian Affairs and U.S. National Security Council, "Future U.S. Policy in the Persian Gulf," 1970, 13, 1679069864; PR00508, Digital National Security Archive.

179 U.S. Department of State, "The Evolution of the U.S.-Iranian Relationship: A Brief Overview of the U.S.-Iranian Relationship 1941–1979," 16.

180 U.S. Department of State, "The Evolution of the U.S.-Iranian Relationship: A Brief Overview of the U.S.-Iranian Relationship 1941–1979," 16; U.S. Department of State, Bureau of Near Eastern and South Asian Affairs and U.S. National Security Council, "Future U.S. Policy in the Persian Gulf," 18.

181 U.S. National Security Council, Staff, "President Ford's Meeting with Mohammed Reza Pahlavi," 1975, 3–4, 1679113045; KC00431, Digital National Security Archive.

182 Ibid., 5.

was "making trouble."[183] Finally, he expressed concern about the security situation between India and Pakistan, and, referring to Pakistan, stated, "We should give them the ability to defend themselves."[184] The Shah portrayed Iran as being at the center of regional affairs and the promotion of regional security.

As the decade advanced, domestic stability decreased. In 1979, the Shah fled the country and Ayatollah Ruhollah Khomeini returned to Iran from Paris, France. Iran's Islamic Revolution commenced and Khomeini became the country's leader. The U.S.-Iranian relationship spiraled downward. The lowest point was the Iran hostage crisis beginning in November of that year when Iranian protestors broke into the U.S. Embassy in Tehran and took embassy employees hostage.[185] More than 50 Americans were held captive for 444 days before they were finally released on January 20, 1981.[186]

The country focused on exporting its Islamic Revolution to places like Lebanon, sending its Revolutionary Guards to work alongside Shia militants, namely Hezbollah.[187] Iran used Lebanon as a hub for its third country revolutionary activities.[188] This singular focus on revolutionary activities was soon interrupted, however, when the country was attacked by Iraq.

Saddam Hussein launched the Iran-Iraq War in 1980, posing an existential threat to Iran. Iran had few friends following the 1979 revolution and finding ways to strengthen its military capabilities proved a challenge. In addition to the United States, Iran had a poor relationship with the Soviet Union in the 1980s because of the Soviet Union's disapproval of Iran's continuation of the Iran-Iraq War.[189] In fact, according to

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183 Ibid., 5–6.

184 Ibid., 7.

185 "Jan. 20, 1981—Iran Releases American Hostages as Reagan Takes Office," *New York Times*, The Learning Network, January 20, 2012, http://learning.blogs.nytimes.com/2012/01/20/jan-20-1981-iran-releases-american-hostages-as-reagan-takes-office/?nytmobile=0.

186 Ibid.

187 Norton, *Hezbollah*, 34.

188 Hala Jaber, *Hezbollah*, Revised Edition (New York: Columbia University Press, 1997), 80.

189 John Parker, *Persian Dreams: Moscow and Tehran Since the Fall of the Shah*, First Edition (Washington, DC: Potomac Books, 2008), 28.

John Parker, relations with the Soviet Union only improved in the late 1980s after the Soviets left Afghanistan and Khomeini wrote a letter to Mikhail Gorbachev.[190] As the war with Iraq dragged on, Iran found friends such as Syria and Libya and attempted to compensate for its lack of allies and military shortcomings with self-reliance. After eight years, the war drew to a close. Nevertheless, Iran's feeling of vulnerability from being attacked by Iraq and having few allies seemed to linger.

b. Nuclear Program

Iran established its nuclear program in 1957 in response to the "Atoms for Peace" initiative.[191] Iran began to construct the Tehran Research Reactor, a light water research reactor, in 1960 and it went critical in 1967.[192] The reactor was supplied by the United States and subject to IAEA safeguards.[193] The United States also transferred uranium and plutonium to Iran for use with the reactor, with the final shipment occurring in 1976.[194] Iran signed the NPT after its creation in 1968 and ratified it several years later.

Iran's actions and statements regarding nuclear capabilities in the early 1970s led to questions regarding Iran's intentions. By 1973, the Shah had plans to acquire a significant nuclear power capability—20 nuclear power plants to generate 23,000 MWs of electricity.[195] Iran established the Atomic Energy Organization of Iran in 1974. The Shah made a controversial statement to the French newspaper *Le Monde* in February 1974 that "one day 'sooner than is believed,' Iran would be 'in possession of a nuclear bomb.'"[196] Iranian officials quickly refuted this statement. On June 23, 1974, the Shah

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190 Ibid., 29.

191 "Profile for Iran—Nuclear," Nuclear Threat Initiative, accessed January 21, 2016, http://www.nti.org/country-profiles/iran/nuclear/.

192 Research Reactor Database.

193 Ibid.

194 U.S. Department of State, "U.S. Supplied Nuclear Material to Iran, September 1967 to May 1976," 1980, 1679061704; IR03551, Digital National Security Archive.

195 Central Intelligence Agency, Directorate of Intelligence, "Middle East-South Asia: Nuclear Handbook," 1988, 26, 1679115999; WM00317, Digital National Security Archive.

196 Abbas Milani, "The Shah's Atomic Dreams," *Foreign Policy*, December 29, 2010, https://foreignpolicy.com/2010/12/29/the-shahs-atomic-dreams/.

made a similar statement to French weekly *Les Informations*.[197] This was on the same day that India announced that it might test a hydrogen device.[198] Again, the Shah quickly retracted the statement, reiterating that he sought a NWFZ in the Middle East.[199] Iran had joined Egypt in calling for a NWFZ in 1974. In 1975, when asked if any Iranian institutions might push for Iran to acquire nuclear weapons, the Shah responded: "I not only make the decisions, I do the thinking." He continued, "I believe it will not be different when I am not here and there is another king."[200] In 1974, the U.S. intelligence community assessed that by the mid-1980s, "if Iran has a full-fledged nuclear power industry and all the facilities necessary for nuclear weapons, and if other countries have proceeded with weapons development, we have no doubt that Iran will follow suit."[201]

U.S. policy toward Iran focused on negotiations for the export of nuclear reactors in the mid-1970s during the Gerald R. Ford administration. According to William Burr, the negotiations became particularly heated over the subject of Iran's desired capabilities for the reprocessing of spent fuel.[202] Burr noted that Iran wished to have a national reprocessing capability while the United States insisted on a U.S. role in the reprocessing of spent nuclear fuel.[203] After India's nuclear test in 1974 that took the international community by surprise, the United States began to closely scrutinize activities at commercial nuclear reactors, especially the use of spent fuel.[204] By 1978, Iran had accepted a U.S. veto over the reprocessing or enrichment of nuclear material of U.S.

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197 *Les Informations* article quoted in cable from U.S. Embassy Paris, "Interview with Shah," June 24, 1974, http://nsarchive.gwu.edu/nukevault/ebb268/doc01a.pdf.

198 Ronald Koven, "Iran Eyes Nuclear Weapons: India Reported Ready to Try Hydrogen Test," *Washington Post*, June 24, 1974, A1.

199 Jonathan C. Randal, "Shah Denies Planning A-Bombs," *Washington Post*, June 25, 1974, A14.

200 Joseph Kraft, "What Restrains the Shah?," *Washington Post*, April 27, 1975, C7.

201 Director of Central Intelligence, "Special National Intelligence Estimate 4–1-74: Prospects for Further Proliferation of Nuclear Weapons," August 23, 1974, 38, http://nsarchive.gwu.edu/NSAEBB/NSAEBB240/snie.pdf.

202 Burr, "A Brief History of U.S.-Iranian Nuclear Negotiations," 27.

203 Ibid., 27.

204 Ibid., 22.

origin.[205] The negotiations concluded with an agreement for the sale of eight nuclear reactors to Iran by the United States.[206]

Iran also looked to other countries for nuclear power technology. Two European companies had already signed contracts to construct four nuclear power plants in Iran. Iran signed a contract with a West German company for two nuclear power plants at Bushehr in 1976.[207] The country also finalized an agreement with a French company for two plants at Darkhovin in 1977.[208]

Nuclear efforts in Iran were stymied, however, due to the country's Islamic revolution. As the internal political and economic situation in Iran declined in the lead-up to the revolution, nuclear activity in Iran ground to a halt in 1978 due to major reductions in government spending.[209] Iran's nuclear efforts temporarily halted altogether in 1979 after the Shah fled Iran and the new revolutionary regime dismissed the country's need for a nuclear program.[210] The Ayatollahs rejected all things deemed "western" to include the country's nascent nuclear program. The leader of Iran's revolution, Ayatollah Ruhollah Khomeini, declared after coming to power, "We will not play the policeman of the Persian Gulf."[211] The French had not yet initiated the work on their promised reactors, but the two German reactors were over halfway completed.[212] The plants under construction were not finished and the nuclear agreement with the United States was never signed.[213] Iran lost a significant share of the human capital in its nuclear program

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[205] Ibid., 30.

[206] Ibid., 30.

[207] "Nuclear Power in Iran," World Nuclear Association, January 21, 2016, http://www.world-nuclear.org/info/Country-Profiles/Countries-G-N/Iran/.

[208] Ibid.

[209] Milton R. Benjamin, "Iran Cuts Back Nuclear Plans To Save Money," *Washington Post*, October 23, 1978, A1.

[210] Burr, "A Brief History of U.S.-Iranian Nuclear Negotiations," 31.

[211] Paul Lewis, "Khomeini Demands Review of Iran's Foreign Deals: Ayatollah Will Visit Cemetery," *New York Times*, January 22, 1979, A11.

[212] Bhatia, *Nuclear Rivals in the Middle East*, 84.

[213] Burr, "A Brief History of U.S.-Iranian Nuclear Negotiations," 30–31.

after the fall of the Shah. Many Iranian scientists departed and while Atomic Energy Organization of Iran employees had numbered 4,500 before the revolution, by 1988 there were only 800.[214] Nevertheless, the U.S. intelligence community assessed that the progress made under the Shah provided Iran with a baseline nuclear capability.[215] Additionally, Shyam Bhatia noted that Iran maintained a 15 percent share of the Namibian Rossing uranium mine.[216]

Khomeini quickly reversed course on the nuclear issue after Iraq invaded Iran in September of 1980, posing an existential threat to Iran. In fact, in a 1988 letter, written a year before his death, Khomeini cited the need for Iran to acquire nuclear weapons to prosecute the war against Iraq.[217] As Iran turned its resources to self-defense, its leadership focused on the country's nuclear program and how to restart it. According to the U.S. intelligence community, Iran opened up negotiations with West German and French suppliers in 1982.[218] The most progress had been made on one of the Bushehr reactors and Iran sought out foreign assistance to complete it.[219] According to the Nuclear Threat Initiative, work on the Bushehr reactor restarted in 1984.[220] Iran worked steadily to obtain expertise and capability in the nuclear arena. The challenge was finding foreign partners.

Iran found willing partners in China and Pakistan. China, which had not yet signed the NPT, assisted Iran with its nuclear program from the mid-1980s through the mid-1990s. John Garver noted that, under a 1985 agreement, China partnered with Iran to

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214 Bhatia, *Nuclear Rivals in the Middle East*, 86.

215 Central Intelligence Agency, Directorate of Intelligence, "Middle East-South Asia: Nuclear Handbook," 25.

216 Bhatia, *Nuclear Rivals in the Middle East*, 83.

217 Iranian Labour News Agency (ILNA), Tehran, in Persian, 29 September 2006, reproduced in English in Council on Foreign Relations, "Letter from Ayatollah Khomeini Regarding Weapons During the Iran-Iraq War," accessed May 13, 2016, http://www.cfr.org/iran/letter-ayatollah-khomeini-regarding-weapons-during-iran-iraq-war/p11745.

218 Central Intelligence Agency, Directorate of Intelligence, "Middle East-South Asia: Nuclear Handbook," 27.

219 Ibid.

220 "Profile for Iran—Nuclear."

create the Esfahan Nuclear Research Center, a facility undeclared to the IAEA until 1992.[221] The White House provided information to the U.S. House of Representatives that China's support included "cooperation on uranium geology and exploration, training for Iranian personnel, and supply of several small research reactors and related laboratory facilities."[222] According to this same report, China provided Iran with an electromagnetic separation machine.[223] China began construction on four nuclear reactors for Iran between 1988 and 1990 and they all went critical between 1992 and 1995.[224] In 1990, China trained Iranian personnel on nuclear issues.[225] Pressured by the United States, China finally admitted to the sale of nuclear technology to Iran in 1990.[226]

Iran also benefited from Pakistan's nuclear expertise. The Nuclear Threat Initiative noted that Iran signed an agreement in 1987 for Pakistan to train Iran's personnel.[227] In addition, according to an IAEA report and David Albright, Iran secretly acquired P-1 centrifuge parts and designs through the A.Q. Khan network in 1987.[228] Further, Garver assessed that Chinese engineers may have helped Iran to further develop and integrate the parts and designs provided by A.Q. Khan.[229] The Iran-Iraq War ended in 1988, but Iran continued to forge ahead with its nuclear program secretly.

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221 John W. Garver, *China and Iran* (Seattle: University of Washington Press, 2006), 143.

222 The White House, *Agreement for Nuclear Cooperation Between the United States and China: Communication from the President of the United States, Transmitting a Report Relating to the Approval and Implementation of the Agreement for Nuclear Cooperation Between the United States and the People's Republic of China, pursuant to 42 U.S.C. 2153(b).*, House Document, 105th Congress, 2nd Session; 105–197, 37 p. (Washington, DC: U.S. Government Printing Office, 1998), 8, http://catalog.hathitrust.org/Record/011331284.

223 Ibid., 8.

224 Garver, *China and Iran*, 144.

225 Cirincione, Wolfsthal, and Rajkumar, *Deadly Arsenals*, 303.

226 Central Intelligence Agency, "China-Iran: Beijing Acknowledge Sale of Nuclear Technology," FOIA Collection, November 6, 1991, 1, http://www.foia.cia.gov/document/0001287117.

227 "Profile for Iran—Nuclear."

228 International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement and Relevant Provisions of Security Council Resolutions 1737 (2006) and 1747 (2007) in the Islamic Republic of Iran," November 15, 2007, 3, https://www.iaea.org/sites/default/files/gov2007-58.pdf; David Albright, *Peddling Peril: How the Secret Nuclear Trade Arms America's Enemies*, First Edition (New York: Free Press, 2010), 77–78.

229 Garver, *China and Iran*, 144.

In terms of delivery systems, Iran's supplier changed from the United States to China after the 1979 revolution. According to Mohamed Kadry Said, Iran had received its first ballistic missiles from the United States as U.S.-provided MGM-52 Lance short-range ballistic missiles arrived in 1974.[230] After 1979, China worked with Iran on its delivery systems. The International Institute for Strategic Studies noted that China helped Iran develop a rocket capability in the middle of the Iran-Iraq War—the Oghab with a 40 km range and the Iran-130 with a 130 km range.[231] A 1988 U.S. Department of State report stated that China provided weapons to both sides in the Iran-Iraq War and became Iran's most important weapons supplier by 1987.[232]

In the mid- to late 1980s, additional countries assisted Iran to acquire missiles. Between 1985 and 1988, first Libya and Syria and then North Korea provided liquid-fueled Scud-B missiles to Iran, according to the International Institute for Strategic Studies.[233] These missile acquisitions would allow Iran to respond to Iraqi missile attacks. The institute's report further stated that North Korea later helped Iran develop the capability to produce Scud-B missiles, renamed Shahab-1 missiles, and Scud-C missiles, renamed Shahab-2 missiles.[234] The Arms Control Association noted that the Shahab-1 had a range of 300 kilometers and the Shahab-2 had a range of 550 kilometers.[235]

c. Nuclear Trends

Two shifts occurred in Iran's nuclear program over this time period. Iran's possible pursuit of nuclear weapons through the 1970s appeared to end with the fall of the Shah in 1979. It then began again in 1982 after the start of the Iran-Iraq War. In the

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230 Mohamed Kadry Said, "Missile Proliferation in the Middle East: A Regional Perspective," *Disarmament Forum* No. 2 (March 2001): 51.

231 International Institute for Strategic Studies, *Iran's Strategic Weapons Programmes: A Net Assessment*, First Edition (London: Routledge, 2005), 87, http://dx.doi.org/10.4324/9780203824078.

232 U.S. Department of State, Bureau of East Asian and Pacific Affairs, "Chinese Arms Sales to the Middle East," 1988, 1, 1679040781; CH00944, Digital National Security Archive.

233 International Institute for Strategic Studies, *Iran's Strategic Weapons Programmes: A Net Assessment*, 87.

234 Ibid., 89.

235 "Worldwide Ballistic Missile Inventories."

mid-1970s, a deal for the United States to provide Iran with nuclear power reactors came under additional U.S. scrutiny after the peaceful nuclear explosion carried out by India and subsequent U.S. efforts to establish the Nuclear Suppliers Group. These U.S. power reactors were not delivered. Iran then advanced its ability to acquire fissile material in the 1980s through nuclear technology transfers from China and the A.Q. Khan network. During the 1980s, Iran also began to build an indigenous missile program with the assistance of North Korea.

What drove Iran's nuclear behavior? In the regional context, Iran advanced its nuclear capabilities in the 1980s due to an existential threat from Iraq. The Shah envisioned Iran as a regional power and a nuclear capability as a part of that identity. When the Shah was overthrown, however, Iran's new leader discarded the Shah's nuclear initiatives. Khomeini scorned the identity of Iran as a regional power in league with a superpower, the United States. For him, rejecting Iran's nuclear program, which was western technology, was synonymous with rejecting the United States. Khomeini quickly reversed course, however, when faced with the threat posed by Iraq during the Iran-Iraq War. Pragmatic Iranian leaders came to realize that nuclear weapons could serve an important purpose for the country.

3. Iraq

Iraq desired to secure a position as the regional hegemon. After Iran's 1979 revolution, Iraq's leadership perceived that its neighbor Iran was militarily weak and launched an attack against Iran in 1980. Iraq had the upper hand. The country had a stronger military and it received support from both the United States and the Soviet Union. Iraq was not able to convert those advantages to military success, however, and the war ended without a clear winner eight years later. In 1990, Iraq invaded Kuwait resulting in a military response from a U.S.-led coalition, the First Gulf War.

Iraq's leadership started pursuing a nuclear weapons capability in the 1970s.[236] Israel bombed Iraq's nuclear reactor at Osirak in 1981 just before it went critical.[237] This bombing raid appeared to bolster Iraq's determination and Iraq continued its nuclear program, but covertly. It relied on electromagnetic isotope selection technology to advance its nuclear weapons program. Iraq made significant progress toward a nuclear weapons capability through 1990. In tandem with its nuclear efforts, Iraq aggressively worked to expand its ballistic missile capabilities.

a. Political Context

The Iraqi Ba'ath Party came into power in 1968 led by Ahmed Hassan Al-Bakr. A period of economic and political stability followed with Iraq modernizing its business, education, and technology sectors. In 1973, this era of modernization was in full swing. Saddam Hussein replaced Al-Bakr as president in 1979. Hussein continued to lead Iraq's modernization and vied for leadership of the Arab world with regional states.

Iraq faced political challenges on the domestic front. The Iraqi population primarily consisted of Sunni Arabs, Shia Arabs, and Sunni Kurds. Hussein's regime, however, was dominated by Sunni Arabs and repressed the Shia Arabs and the Kurds. The Iraqi Kurds, led by Mustafa Barzani, rebelled against Baghdad's rule throughout the 1960s and then again in the 1980s led by Masud Barzani and Jalal Talabani. During the 1980s, Hussein attacked the Kurds with chemical weapons.

In terms of the regional environment, Iraq's political relations were characterized primarily by disputes over border issues with Kuwait and Iran. Hussein also used the issue of Israel to bolster Iraq's regional standing. The Duelfer Report noted that Hussein believed he had a "divine mission to liberate Jerusalem," but this was also a strategy to

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[236] Iraq Survey Group, "Comprehensive Report of the Special Advisor to the DCI on Iraq's WMD [The Duelfer Report, Volume II of III; 'Nuclear'; Includes Annexes; Part 2 of 2]," 2004, 3, 1679114963; WM00606, Digital National Security Archive; Khidhir Hamza and David Albright, "Inside Saddam's Secret Nuclear Program," *Bulletin of the Atomic Scientists* 54, no. 5 (1998): 28, https://doi.org/10.1080/00963402.1998.11456882.

[237] International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran*, 87; U.S. White House Situation Room, "U.S. Statement on Israeli Strike," 1981, 1679137097; TE00671, Digital National Security Archive.

gain support from regional states.[238] Otherwise, Syria, rather than Israel, appeared to be Iraq's adversary in the Levant.[239]

As Hussein sought to improve Iraq's regional standing, he saw a weakness in his neighbor Iran after the 1979 revolution and decided to attack in September 1980. Iraq's military capabilities were greater than Iran's capabilities. Iraq was also supported by both the United States and the Soviet Union. Iran fought back hard, however, and Hussein made some poor strategic decisions. One of them was to prolong the war in order to acquire more territory in the mid-1980s. Iraq emerged from the war in 1988 without a clear victory, debts, and a battered population.

Following the Iran-Iraq War, the United States sought to expand relations with Iraq as it saw the potential for Iraq to play a regional leadership role and be a trade partner. For example, the U.S. Department of State assessed that Iraq could be "a prominent member in a loose alignment of conservative Arab states featuring Egypt, Jordan, Saudi Arabia, and Kuwait."[240] While the United States would not support Iraqi hegemony in the Gulf, it favored a role for Iraq that involved promoting regional stability and containing Iran.[241] The U.S. Department of Agriculture viewed Iraq as a good customer for U.S. agricultural products.[242]

In the international context, the United States saw the warming of U.S.-Iraq relations in the late 1980s as a way to draw Iraq away from the Soviets since Iraq would not need a constant supply of basic Soviet weaponry following the Iran-Iraq War.[243] According to Lawrence Freedman, "the first indication of the administration's reappraisal

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238 Iraq Survey Group, "Comprehensive Report of the Special Advisor to the DCI on Iraq's WMD [The Duelfer Report, Volume I of III; 'Transmittal Message' and 'Regime Strategic Intent'; Includes Charts, Photographs, Tables and Illustrations; Part 1 of 3]," 2004, 31, 1679117273; WM00602, Digital National Security Archive.

239 U.S. Department of State, "Guidelines for U.S.-Iraq Policy," Background Paper (1989), 4, 1679140725; IG00761, Digital National Security Archive.

240 Ibid., 1.

241 Ibid., 4.

242 Ibid., 2.

243 Ibid., 4.

came in May 1982, when Iraq was taken off the list of countries supporting terrorism. With Syria, Libya, and South Yemen, it had been a founding member on the list. As it was removed, Iran was added."[244]

The United States' favorable view of Iraq changed quickly, however, when Saddam Hussein made the decision to invade Kuwait on August 2, 1990. Perhaps Hussein reasoned that acquiring Kuwait could help solve some of the country's post-war financial problems. Iraq also launched some missiles at Saudi Arabia and its other neighbors in the process. While Iraq was the favored party to win in the Iran-Iraq War, this was not the case regarding the invasion of Kuwait. The Gulf countries strongly opposed Iraq's actions and sought U.S. assistance in 1990 to force Iraq to return to its own national boundaries.

b. Nuclear Program

Iraq began its nuclear program in the 1950s assisted by the Soviet Union. Iraq founded the Iraqi Atomic Energy Commission in 1956. In 1962, Iraq began construction on its first, Soviet-supplied nuclear research reactor, the IRT-5000.[245] It went critical in 1967 and was subject to IAEA safeguards. Nevertheless, some reluctance accompanied this transfer of nuclear technology from the Soviet Union to Iraq. Former Soviet Ministry of Foreign Affairs official Oleg Grinevsky recalls Nikita Khrushchev's response when briefed regarding the bilateral agreement with Iraq to provide a small nuclear reactor in 1959. Khrushchev stated, "First we have the Chinese asking for bombs, now we have Arabs asking the same. We will get the [sic] headache after all. We will cooperate, but we will not give any bombs!"[246] It seemed the Soviet Union was willing to share nuclear technology with the Middle East, but was also keen to ensure that not enough capability was provided to construct a nuclear weapon.

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[244] Lawrence Freedman, *A Choice of Enemies: America Confronts the Middle East*, Reprint Edition (New York: Public Affairs, 2009), 160.

[245] Research Reactor Database.

[246] Valery Yaremenko, "Storm in Babylon," trans. Dmitry Sudakov, *Pravda*, March 10, 2003, http://www.pravdareport.com/world/ussr/10-03-2003/1941-iraq-0/.

European states made additional nuclear agreements with Iraq in the 1970s. Ronald Chesser asserted that, in 1976, Iraq brokered a deal with France for two more light water reactors.[247] In 1979, an Italian company sold facilities for fuel manufacturing and plutonium separation to Iraq, according to the Nuclear Threat Initiative.[248]

Iraqi interest in acquiring nuclear weapons began in the early 1970s. The Iraqi government formulated a plan to pursue nuclear weapons in 1971 when Hussein was Vice-President of Iraq, according to the Duelfer Report.[249] Furthermore, Hussein continued to have a close relationship with the Iraqi Atomic Energy Commission because he served as its president from 1973 to 1979.[250] The U.S. intelligence community wrote that by the mid-1970s, he had expressed interest in acquiring an "Arab bomb."[251] U.S. intelligence assessed in 1979 that Iraq's driving motivation for nuclear weapons was to establish itself as a regional power.[252] And, although the temporary termination of Iran's nuclear program after Iran's revolution benefited Iraq, it still perceived Iran to be a threat to its regional security interests in the future, according to U.S. intelligence.[253] Iraq continued its acquisition of nuclear capabilities during the Iran-Iraq War. Chesser noted that in the early 1980s, two French-supplied reactors, Tammuz-1 and Tammuz-2, were

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[247] Ronald K. Chesser et al., "Piecing Together Iraq's Nuclear Legacy," *Bulletin of the Atomic Scientists* 65, no. 3 (May 1, 2009): 19, https://doi.org/10.2968/065003004.

[248] "Profile for Iraq—Nuclear," Nuclear Threat Initiative, accessed February 15, 2016, http://www.nti.org/country-profiles/iraq/nuclear/.

[249] Iraq Survey Group, "Comprehensive Report of the Special Advisor to the DCI on Iraq's WMD [The Duelfer Report, Volume II of III; 'Nuclear'; Includes Annexes; Part 2 of 2]," 3; Hamza and Albright, "Inside Saddam's Secret Nuclear Program," 28.

[250] Iraq Survey Group, "Comprehensive Report of the Special Advisor to the DCI on Iraq's WMD [The Duelfer Report, Volume II of III; 'Nuclear'; Includes Annexes; Part 2 of 2]," 3.

[251] Central Intelligence Agency, "In Response to Questions Regarding Key Milestones in Our Assessments of Iraq's Nuclear Program," FOIA Collection, September 14, 2002, 1, http://www.foia.cia.gov/document/0005607098.

[252] Central Intelligence Agency, U.S. National Intelligence Officer for Nuclear Proliferation, "Iraq's Nuclear Interests, Programs, and Options," Interagency Intelligence Memorandum, October 1979, 5, http://nsarchive.gwu.edu/nukevault/ebb451/docs/4.pdf.

[253] Ibid., 7.

built.[254] Iran attacked Iraq's nuclear complex twice during the war and succeeded in damaging, but not destroying it.

Israel's concern over the Iraqi nuclear program seemed to increase with progress on the nuclear reactors. According to the International Institute for Strategic Studies, Israel made the decision to destroy Tammuz-1 at Osirak in a bombing raid conducted on June 7, 1981 before the reactor became critical.[255] The attack caused a political backlash in the Arab World. In addition, the United States government made a statement that next day noting that "available evidence suggests U.S.-provided equipment was employed in possible violation of the applicable agreement under which it was sold to Israel."[256] According to the U.S. National Security Council, a subsequently drafted legal document discussed the suspension of the sales of F-16s to Israel, the aircraft used in the attack.[257] Nevertheless, the deliveries were not permanently suspended.

How did Iraq react to this incident? A U.S. Interagency Intelligence Assessment noted that while Hussein did criticize the United States for giving military hardware to Israel, "he did not repeat even standard criticisms of the United States in his first public speech after the raid" and that "this restraint may reflect his continuing determination to balance his relations with the superpowers."[258] According to U.S. intelligence, Iraq requested that France rebuild the reactor, which the French government initially agreed to do.[259] The U.S. intelligence report further noted that France did not follow through on the agreement and only conducted some site cleanup.[260]

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254 Chesser et al., "Piecing Together Iraq's Nuclear Legacy," 19.

255 International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran.*, 87.

256 U.S. White House Situation Room, "U.S. Statement on Israeli Strike," 1.

257 U.S. National Security Council, "Israeli Strike—Legal Aspects," 1981, 1, 1679136468; TE00672, Digital National Security Archive.

258 Central Intelligence Agency, "Implications of Israeli Attack on Iraq," Interagency Intelligence Assessment, National Intelligence Council Collection, June 3, 1981, 8, http://www.foia.cia.gov/document/0000211961.

259 Central Intelligence Agency, Directorate of Intelligence, "Middle East-South Asia: Nuclear Handbook," 32.

260 Ibid., 33.

In terms of regional relations following the Osirak attack, Hussein gauged his reaction to improve his position in relation to the Iran-Iraq War primarily and to create a united Arab front against Israel secondarily.[261] U.S. intelligence judged that Hussein tried "to use the heightened anti-Israeli sentiment to improve Iraq's ties with Syria and Libya, Iran's principal Arab backers. He would like to end Libyan and Syrian military aid to Iran, to create a solid Arab front against Tehran, and to put pressure on Tehran to negotiate an end to the war."[262] In terms of regional rivals, Saudi Arabia, Syria, Egypt, Iran, and Turkey, were likely relieved the Osirak nuclear reactor was destroyed.[263] Nevertheless, Saudi Arabia publicly supported Iraq and offered to provide funds to help rebuild the reactor.[264]

Following the attack on its nuclear facilities, Iraq began to clandestinely pursue a nuclear weapons capability with new fervor. Iraq had explored electromagnetic isotope separation previously in 1980 and, following Israel's attack on its facilities, Iraq decided to rely on electromagnetic isotope separation for uranium enrichment, according to the International Institute for Strategic Studies.[265] In addition, Tammuz-2 went critical in 1987 and was subject to IAEA safeguards.[266] In 1987, Iraq arranged for a company from Yugoslavia to construct a facility to generate 15 kilograms of weapons-grade uranium per year and decided to build a second electromagnetic isotope separation.[267] The Nuclear Threat Initiative highlighted that, in 1988, Iraq pursued gas centrifuges for uranium enrichment aided by West Germany rather than continue with gaseous diffusion.[268] Iraq also continued to work on nuclear design and assembly. The Duelfer Report noted a

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[261] Central Intelligence Agency, "Implications of Israeli Attack on Iraq," 8.

[262] Ibid., 8.

[263] Bahgat, *Proliferation of Nuclear Weapons in the Middle East*, 58.

[264] U.S. Embassy Riyadh, "Démarche on Saudi Aid for Iraqi Nuclear Program," 1989, 2, 1679130433; IG00837, Digital National Security Archive.

[265] International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran.*, 88.

[266] Chesser et al., "Piecing Together Iraq's Nuclear Legacy," 19.

[267] International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran.*, 88.

[268] "Profile for Iraq—Nuclear."

conversation with Iraqi Vice President Taha Yassin Ramadan where he stated that Hussein had become "very concerned about Iran's nuclear weapons program late in the Iran-Iraq War and accelerated Iraq's nuclear weapons research in response" and "by January 1991, Iraq was within a few years of producing a nuclear weapon."[269]

The United States seemed to be aware that Iraq was pursuing a nuclear weapons capability, but believed that those aspirations could be contained and that the greater U.S. strategic interest was served by maintaining a relationship with Iraq. For example, in 1989, the U.S. State Department lamented U.S. inability to completely block Iraq's nuclear development work while emphasizing the importance of trade restrictions to make some progress toward this goal.[270] The United States, however, underestimated Saddam's motivation for acquiring a nuclear weapon. The Duelfer Report noted that Hussein believed nuclear weapons were critical for Iraq's survival.[271] Ethel Solingen assessed that, if Iraq had not invaded Kuwait, Iraq likely would have acquired nuclear weapons.[272]

Iraq worked throughout this time period on improving its delivery capabilities. Iraq acquired its first Scud-B missiles from the Soviet Union, according to the Nuclear Threat Initiative.[273] This same report also noted that, during the early part of the Iran-Iraq War, Iraq altered the Scud-B missile to produce the Al-Hussein missile with a range of over 600 km, putting Tehran within reach.[274] Bermudez stated that, in 1984, Egypt and Iraq signed an agreement with Argentina to develop a medium-range ballistic missile system, the Condor II project, but ended this cooperation before the end of the decade

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269 Iraq Survey Group, "Comprehensive Report of the Special Advisor to the DCI on Iraq's WMD [The Duelfer Report, Volume I of III; Annexes C-L and 'Regime Strategy and Timeline Events'; Part 3 of 3]," 2004, 28, 1679113777; WM00604, Digital National Security Archive.

270 U.S. Department of State, "Guidelines for U.S.-Iraq Policy," 5.

271 Iraq Survey Group, "Comprehensive Report of the Special Advisor to the DCI on Iraq's WMD [The Duelfer Report, Volume I of III; Annexes C-L and 'Regime Strategy and Timeline Events'; Part 3 of 3]," 26.

272 Solingen, *Nuclear Logics : Contrasting Paths in East Asia and the Middle East*, 151.

273 "Profile for Iraq—Missile," Nuclear Threat Initiative, accessed July 20, 2015, http://www.nti.org/country-profiles/iraq/delivery-systems/.

274 Ibid.

without either country acquiring the missile.[275] The United Nations Monitoring, Verification, and Inspection Commission reported that, by 1989, Iraq had begun to test a missile, named Al-Abid, designed to be a space launch vehicle.[276] For Hussein, ballistic missiles were a key part of the nation's military capabilities. According to the Duelfer Report, he believed they played a crucial role in bringing an end to the Iran-Iraq War after the volley of missiles launched by Iraq in the 1988 "War of the Cities."[277]

c. Nuclear Trends

Iraq began a quest for the "Arab bomb" in the 1970s. That quest turned clandestine and intensely practical with the pursuit of electromagnetic isotope separation capabilities after Israel bombed the Osirak reactor in 1981. Towards the end of the Iran-Iraq War, Iraq's program shifted forward once again due to concerns about the Iranian threat. Thus, for Iraq there seemed to have been three shifts forward toward an increased nuclear weapons capability. During this time period, Iraq advanced its ability to produce fissile material. The country also made progress in extending the range of its ballistic missiles, a possible delivery system. A possible source of technology for a medium-range ballistic missile, the Condor II program, however, came to a halt. The end of this program was due largely to U.S. pressure on Argentina following the creation of the Missile Technology Control Regime.

What drove Iraq's nuclear behavior? The first shift forward in its nuclear program seemed to be driven by a desire for regional primacy and the second and third shifts appeared to be in response to Iraq's rivalry with Iran. The decisions regarding developing Iraq's nuclear program were based on its perception of the regional security environment. As Hussein surveyed possible threats to Iraq, Iran was always viewed as the greatest

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[275] Bermudez Jr, "Ballistic Missile Development in Egypt."

[276] United Nations Monitoring, Verification, and Inspection Commission, "Compendium Summary" (United Nations, June 21, 2006), http://www.un.org/Depts/unmovic/new/documents/compendium_summary/s-2006-420-English.pdf.

[277] Iraq Survey Group, "Comprehensive Report of the Special Advisor to the DCI on Iraq's WMD [The Duelfer Report, Volume I of III; 'Transmittal Message' and 'Regime Strategic Intent'; Includes Charts, Photographs, Tables and Illustrations; Part 1 of 3]," 42.

threat, not Israel. Hussein did not view the United States as its enemy and even at times desired better relations between the two countries.[278]

4. Libya

Libya approached regional politics with revolutionary fervor and sought to be a regional leader. Libya supported the Palestine Liberation Organization and the revolutionary regime in Iran. The country earned the ire of the United States and the West by sponsoring terrorism against Western targets in the 1980s. As the decade drew to a close, however, Libya worked to distance itself from international terrorism. Libya also pursued a nuclear weapons capability beginning in 1973, if not earlier. Libya persistently worked to augment its nuclear program throughout the time period. While the United States was aware of Libya's program and took steps to constrain Libya's nuclear efforts, Libya was able to continue advancing its nuclear capabilities. Libya also labored to expand its ballistic missile capabilities.

a. Political Context

Libyan leader Muammar Qaddafi came to power in 1969. He quickly began to transform the country based on his vision of socialism. Gawdat Bahgat described Qaddafi's beliefs as follows: 1) "the Arab nation was underdeveloped due to the long reign of the Turks that was followed by European occupation" and 2) imperialists "created Israel in the midst of the Arab world to divert the region's resources and keep it weak and divided."[279] Based on this vision, Qaddafi sought to lead and unify the Arab world.

Despite Qaddafi's vision for a unified Arab world, Libya often clashed with regional states. Periodic altercations occurred between Libya and its neighbors, particularly with Chad and Egypt. A 1977 border conflict between Libya and Egypt led to a break in relations until 1989. Libya strongly criticized Egypt for making peace with Israel in 1979. In addition to vying with Iraq for regional leadership, relations between

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[278] Ibid., 31.

[279] Bahgat, *Proliferation of Nuclear Weapons in the Middle East*, 134.

Iraq and Libya took a downturn when Libya provided aid and support to Iran during the Iran-Iraq War.

Libya had a history of supporting the Iranian revolutionary regime. Saud Zahed observed that when Qaddafi came to power, "he joined the Arab leaders' alliance that comprised Jamal Abdul Nasser, Yasser Arafat, Ali Nasser Muhammad and Hafez al-Assad, against Iran's King Mohamed Reza Pahlavi, the last pro-western king who was accused of supporting Israel."[280] Then Libya quickly acknowledged the Khomeini government when the Shah fled.

Libya was a fervent supporter of revolutionary causes. Libya's foreign policy supported the Palestinian cause and decried Israel's existence.[281] It supported the Palestine Liberation Organization and the Irish Republican Army among others. This led to Libya's active involvement in state-sponsored terrorism in the 1980s. Libya was implicated in a 1986 discotheque bombing in West Berlin in which U.S. citizens were killed; in the 1988 bombing of Pan Am Flight 103 over Lockerbie, Scotland; and in the 1989 bombing of a French flight over Niger.[282]

In terms of Libya's relations with the United States, the U.S. Embassy in Tripoli was attacked and set on fire in 1979. It was subsequently closed in 1980. The United States added Libya to its list of State Sponsors of Terrorism in 1979. The United States initially sought to distance itself from Libya both politically and economically. As Libya's terrorist attacks escalated, however, the United States conducted counter-attacks. U.S. and Libyan forces clashed in the Gulf of Sidra multiple times throughout the early to mid-1980s. In 1986, the United States directly attacked selected targets within Libya.[283]

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[280] Saud Zahed, "Tehran Switches Gear in Its Relationship with Tripoli after Qaddafi's Death," *Al Arabiya*, October 22, 2011, https://www.alarabiya.net/articles/2011/10/22/173060.html.

[281] Wyn Q. Bowen, *Libya and Nuclear Proliferation: Stepping Back from the Brink*, First Edition (Abingdon; New York: Routledge, 2006), 14–17.

[282] "State Sponsors: Libya," Council on Foreign Relations, December 1, 2005, http://www.cfr.org/libya/state-sponsors-libya/p9363.

[283] Bowen, *Libya and Nuclear Proliferation*, 16–17.

Despite pressure from the United States, Libya appeared to have desired improved relations with the United States. In an October 3, 1979 memorandum for U.S. President Jimmy Carter, Deputy Secretary of State Warren Christopher noted that Secretary of State Cyrus Vance had met that day with Libyan Foreign Minister Ali Abd-al-Salam Al-Turayki.[284] Christopher related that, in the Turayki meeting, "the main thrust of his presentation was a Libyan desire for improved bilateral relations."[285] On the other hand, Secretary Vance cited "Libyan support for terrorist movements and hostility to the effort to achieve a Middle East settlement as the primary causes of U.S.-Libyan differences."[286] Meanwhile, Libya's relationship with the Soviet Union improved from the early 1970s onward. Qaddafi stated in 1987 that he would allow the Soviet Union to base nuclear missiles in Libya and that he would join the Warsaw Pact.[287]

In the late 1980s, Qaddafi began to pursue a less combative foreign policy. In 1989, Libya sought to improve relations with its neighbors by joining the Arab Maghreb Union, reopening its border with Egypt after over a decade, and signing a peace accord with Chad.[288] It also worked to distance itself from international terrorism in order to improve its relationship with the United States.[289]

b. Nuclear Program

Libya signed the NPT in 1968 and ratified the treaty in 1975. Unlike Egypt, Iraq, and Iran, Libya did not begin its pursuit of nuclear technology until the early 1970s. From nearly the beginning of its nuclear program, however, Libya pursued a nuclear weapons capability. According to U.S. intelligence, Libya sought to purchase nuclear weapons from China in 1973 and 1976, but was unsuccessful in persuading the Chinese to sell the

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284 U.S. Department of State, Secretary (Acting), "Nuclear Reactor Contracts," 1979, 2, 1679045828; AR02068, Digital National Security Archive.

285 Ibid.

286 Ibid.

287 James Barron, "Qaddafi in a Warning to U.S.," *New York Times*, March 23, 1987, A3, http://www.nytimes.com/1987/03/23/world/qaddafi-in-a-warning-to-us.html.

288 Spector, *Nuclear Ambitions*, 181–182.

289 Ibid.

weapons.[290] According to the former Indian Ambassador to the United States, Abid Hussain, Libya sought to procure nuclear weapons technology from India in the late 1970s.[291] Libya also tried to obtain research reactors from the United States and France in the 1970s with no success.[292] U.S. intelligence noted that, between 1978 and 1982, Libya reached out to Argentina, Belgium, Canada, China, Finland, India, Italy, Pakistan, Romania, Switzerland, the United Kingdom, West Germany, and Yugoslavia requesting either nuclear technology or other support.[293] In some cases, Libya reached out to these countries more than once with requests.[294] This was in addition to support from the Soviet Union.[295] According to Bhatia, Libya failed to acquire uranium enrichment technology in the 1970s.[296]

Libya did reap some results from its international outreach. Libya's improving relationship with the Soviet Union allowed Libya to begin acquiring nuclear technology from the superpower.[297] The Congressional Research Service noted that Argentina signed a nuclear cooperation agreement with Libya in 1974 and provided training and equipment for mining and processing uranium.[298] In addition, India provided educational opportunities in the field of civilian nuclear technology for Libyan students in 1978.[299]

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290 Central Intelligence Agency, Directorate of Intelligence, "The Libyan Nuclear Program: A Technical Perspective," 1985, 1, 1679128884; WM00294, Digital National Security Archive; Central Intelligence Agency, Directorate of Intelligence, "Middle East-South Asia: Nuclear Handbook," 43.

291 Keith Bradshers, "India Official Says Qaddafi Sought Atom-Arms Technology in 70's," *New York Times*, October 10, 1991, A11, http://www.nytimes.com/1991/10/10/world/india-official-says-qaddafi-sought-atom-arms-technology-in-70-s.html.

292 International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran.*, 98.

293 Central Intelligence Agency, Directorate of Intelligence, "The Libyan Nuclear Program: A Technical Perspective," 9–11.

294 Ibid.

295 Ibid., 7.

296 Bhatia, *Nuclear Rivals in the Middle East*, 67–68.

297 Central Intelligence Agency, Directorate of Intelligence, "The Libyan Nuclear Program: A Technical Perspective," 5.

298 U.S. Library of Congress, Congressional Research Service, "Libya's Nuclear Energy Situation," 1987, 2, 1679111301; NP02403, Digital National Security Archive.

299 Ibid.

Libya broke ties and stopped oil exports to India, however, when India would not provide nuclear technology exploitable for weapons purposes.[300] According to the Congressional Research Service, rumors also circulated that Libya and Pakistan had a secret nuclear agreement whereby Libya would fund Pakistan's nuclear program in exchange for the first nuclear weapon created.[301]

Libya did acquire a substantial amount of yellowcake. The IAEA reported that between 1978 and 1983, Libya imported 2,263 tons of yellowcake equaling 1,587 tons of uranium.[302] According to the IAEA, one thousand tons was declared to the IAEA and Libya stated that the remainder was acquired prior to the Safeguards Agreement entering into force.[303] Wyn Bowen noted that there was speculation as to whether Libya sent some of this uranium to Pakistan.[304]

The Soviet Union eventually provided a nuclear research reactor. The superpower had insisted that Libya both ratify the NPT and enter into the Safeguards Agreement before it would provide a research reactor.[305] In fact, the Soviet Union had insisted that Libya sign the NPT before it would agree to provide the country with facilities for nuclear research.[306] In 1980, the country's Safeguards Agreement entered into force. Libya began construction of the Soviet-provided IRT-1 in 1980, a light water research reactor, and it went critical in 1981 and was placed under IAEA safeguards.[307] Libya also constructed a critical facility for core modeling for the IRT-1 reactor, which was

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[300] Ibid.

[301] Ibid.

[302] International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement of the Socialist People's Libyan Arab Jamahiriya," GOV/2004/12, February 20, 2004, 3; International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran.*, 99.

[303] International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement of the Socialist People's Libyan Arab Jamahiriya," February 20, 2004, 3.

[304] Bowen, *Libya and Nuclear Proliferation*, 30.

[305] International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran*, 98.

[306] Central Intelligence Agency, Directorate of Intelligence, "The Libyan Nuclear Program: A Technical Perspective," 2.

[307] Research Reactor Database.

placed under safeguards as well.[308] The International Institute for Strategic Studies reported that Libya sought to use this Soviet reactor to produce plutonium and did so in small amounts in the 1980s.[309]

Qaddafi's rhetoric and Libya's sponsorship of terrorism led the United States to see Libya as a threat to regional stability. The resulting pressure from the United States caused other countries to reconsider working with Libya and its nuclear program, complicating Libya's efforts to acquire a nuclear capability. In 1981, a Senior Interagency Group convened by the U.S. State Department proposed: working to stop Libya's "assassination and intimidation campaigns;" coordinating with possible nuclear suppliers to block Libya from acquiring nuclear weapons; forbidding U.S. universities to provide the country with any nuclear training; reducing or ending any international military assistance and training to Libya; and having the U.S. Sixth Fleet conduct exercises in the eastern Mediterranean.[310]

Throughout the 1980s, Libya continued its attempts to advance its nuclear program. These efforts were later reported on by the IAEA. In the early 1980s, Libya worked to develop a capability for uranium gas centrifuge enrichment with foreign assistance, but was unsuccessful.[311] By 1981, Libya sought to acquire a uranium conversion facility.[312] Between 1983 and 1989, Libya used the Tajura Nuclear Research Center to conduct covert uranium enrichment tests.[313] A pilot scale facility for uranium

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[308] Ibid.

[309] International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran*, 99.

[310] U.S. Department of State, "Assessment of Libya's Threat to U.S. Interests throughout the Middle East and Africa," Memo, May 12, 1981, 4, U.S. Declassified Documents Online, http://tinyurl.galegroup.com/tinyurl/5NRSY1.

[311] International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement of the Socialist People's Libyan Arab Jamahiriya," February 20, 2004, 5.

[312] International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement of the Socialist People's Libyan Arab Jamahiriya," May 28, 2004, 4.

[313] International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement of the Socialist People's Libyan Arab Jamahiriya," February 20, 2004, 4; International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement of the Socialist People's Libyan Arab Jamahiriya," May 28, 2004, 3.

conversion arrived from Japan in 1986.[314] Between 1984 and 1990, Libya conducted experiments to make fission product radioisotopes.[315] Libya conceded that it was able to extract a small amount of plutonium during this process.[316] Libya imported uranium hexafluoride and uranium compounds in 1985, but did not declare them to the IAEA.[317] Also in 1985, Libya exported 100 kg of yellowcake to the Soviet Union and then received about 39 kg of uranium hexafluoride, 6 kg of uranium dioxide, and 5 kg of uranium tetrafluoride that same year likely for a uranium conversion facility.[318]

In 1981, Libya started negotiations with Belgium regarding a nuclear cooperation agreement, according to U.S. intelligence.[319] U.S. intelligence further noted that, as of February 1985, Libya still hoped the Belgian Government would ratify a negotiated nuclear cooperation agreement, which would give Libya a general agreement so that it could also negotiate for equipment and training.[320] Primarily due to pressure from the United States, this agreement did not go through.

In addition, Libya began pursuing a nuclear power capability in the 1970s and continued through the 1980s.[321] As of 1985, however, six years of Libyan negotiations with the Soviets for two 440-MW nuclear power reactors had not resulted in an

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314 International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement of the Socialist People's Libyan Arab Jamahiriya," February 20, 2004, 4; International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran.*, 99.

315 International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement of the Socialist People's Libyan Arab Jamahiriya," February 20, 2004, 6.

316 Ibid.

317 Ibid., 8.

318 International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement of the Socialist People's Libyan Arab Jamahiriya," May 28, 2004, 3; International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran.*, 101.

319 Central Intelligence Agency, Directorate of Intelligence, "The Libyan Nuclear Program: A Technical Perspective," 8.

320 Ibid., iv.

321 International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran.*, 98–99.

agreement because of financial obstacles, among other challenges, according to U.S. intelligence.[322]

From Qaddafi's statements, it was clear that he believed the Arab World, and Libya in particular, should possess nuclear weapons. Qaddafi spoke out forcefully in 1987, saying "if there is going to be a game using atomic bombs, then it should not be played against the Arab nation. The Arabs should have it, but we undertake not to drop it on anyone. However, if someone is going to drop one on us, or if someone is going to threaten our existence and independence even without the use of an atomic weapon, then we should drop it on them. This is an essential defensive weapon."[323]

Libya's nuclear program was on the radar of the U.S. foreign policy community, but the United States doubted that Libya would make significant progress. During the mid-1980s, the United States was aware that Libya desired a nuclear weapon, but U.S. intelligence believed that weak leadership and planning, and political and financial obstacles would get in the way of Libyan efforts to acquire nuclear facilities.[324] U.S. intelligence further assessed that Libya's lack of skilled scientists and engineers was an obstacle to progress in its nuclear program and resulted in an overreliance on foreign suppliers for progress.[325] Underscoring this assessment, U.S. intelligence judged in 1985 that the research center at Tajura was in operation, but essentially run by Soviet specialists and not Libyans.[326]

In terms of delivery systems, Libya worked to acquire ballistic missiles in the 1970s and 1980s. The Nuclear Threat Initiative noted that the Soviet Union provided

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[322] Central Intelligence Agency, Directorate of Intelligence, "The Libyan Nuclear Program: A Technical Perspective," iii.

[323] "Al-Qadhdhafi Lectures University Students," Tripoli Television Service, 1958 GMT, June 21, 1987, translated in FBIS-Near East and South Asia, June 26, 1987, quoted in Spector, *Nuclear Ambitions*, 178.

[324] Central Intelligence Agency, Directorate of Intelligence, "The Libyan Nuclear Program: A Technical Perspective," iii.

[325] Ibid.

[326] Ibid.

Libya with short-range Scud-B and Frog-7 missiles in the mid-1970s.[327] According to Cirincione, Wolfsthal, and Rajkumar, Libya also approached the Soviet Union and China to request additional missiles, but was rebuffed.[328] They reported that Libya sought SS-21 and SS-23 missiles from the former and CSS-2, M-9, and M-11 missiles from the latter.[329] Moreover, they noted that Libya tried to develop its own missile, the Al Fatah, indigenously.[330] For its missile development efforts, Libya used what remained of a missile development project run by the West German company Orbital Transport and Rockets, which had ended in 1981 without producing the desired missiles.[331] Thus, Libya was unsuccessful in its efforts to develop the Al Fatah missile.

c. Nuclear Trends

Libya made continual efforts to acquire a nuclear weapons capability from 1973 to 1990 beginning with a request to purchase nuclear weapons from China in 1973. Qaddafi's motivation did not diminish throughout this period. In 1990, Qaddafi remained fixated on acquiring a nuclear weapon. Spector quoted from a 1990 speech by Qaddafi in which he stated: "The world has a nuclear bomb; we should have a nuclear bomb."[332] Qaddafi worked to obtain nuclear technology to produce fissile material and a delivery system and, as a country, Libya made some progress toward these goals.

What drove Libya's nuclear behavior? In the regional context, Qaddafi sought to build a nuclear program to elevate Libya's status in the Arab world. Like Nasser, Qaddafi desired to lead and unify the Arab world, especially after Egypt's 1979 peace agreement with Israel. Qaddafi believed Libya was in competition with Egypt and Iraq for regional

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327 "Profile for Libya—Missile," Nuclear Threat Initiative, accessed July 20, 2015, http://www.nti.org/country-profiles/libya/delivery-systems/.

328 Cirincione, Wolfsthal, and Rajkumar, *Deadly Arsenals*, 324.

329 Ibid.

330 Ibid.

331 "Profile for Libya—Missile"; Judith Miller, "West German Rocket Company Pulls Out of Libya," *New York Times*, December 27, 1981, http://www.nytimes.com/1981/12/27/world/west-german-rocket-company-pulls-out-of-libya.html.

332 "Al-Qadhdhafi Calls for Arab Nuclear ICBM's," Tripoli Television Service, 2106 GMT, April 19, 1990, translated in JPRS-TND, April 29, 1990, 34, quoted in Spector, *Nuclear Ambitions*, 183.

leadership. Qaddafi's statements indicated that he aspired to acquire a nuclear weapon for the Arab world. Denigrating Israel and elevating the Palestinian cause and other revolutionary causes were tactics to place Qaddafi at the center of regional politics. Qaddafi believed that nuclear weapons would help Libya to achieve these goals. Libya also was enmeshed in regional conflict and rivalry in the Middle East—with Egypt, Iraq, and Israel. These two motives were entwined. Qaddafi saw nuclear weapons as a way to be a leader in the Arab world and come out ahead of the country's rivals.

5. Saudi Arabia

Saudi Arabia viewed itself as a close U.S. ally in the Middle East during the Cold War with a prominent regional leadership role. Saudi leadership continually sought to balance its security interests. Tensions arose in the country's relationship with Iran several times during the 1980s. Saudi Arabia's concerns regarding Iraq overtook its worries over Iran, however, with Iraq's invasion of fellow Gulf State Kuwait in 1990. Saudi Arabia's secret acquisition of CSS-2 missiles from China in 1987, as reported by U.S. intelligence, demonstrated that it might take daring steps to protect its security interests in times of perceived vulnerability.[333]

a. Political Context

Saudi Arabia sought to balance the demands of its alliance with the United States with its domestic and regional goals. Saudi Arabia saw itself as a bulwark against communism in the region as a U.S. ally during the Cold War. For example, Saudi Arabia suggested that the Kingdom bore some responsibility for Egypt's 1972 decision to send the Soviet military advisors back to Moscow.[334] Saudi Arabia's overarching security goal, however, was maintaining the stability of the House of Saud. William B. Quandt

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[333] Director of Central Intelligence, "National Intelligence Estimate, NIE 5–91C: Prospects for Special Weapons Proliferation and Control" July 1991, 6, Obtained and contributed by William Burr and included in NPIHP Research Update #11., History and Public Policy Program Digital Archive, http://digitalarchive.wilsoncenter.org/document/116907.

[334] William B. Quandt, *Saudi Arabia in the 1980s: Foreign Policy, Security, and Oil*, First Edition (Washington, DC: Brookings Institution Press, 1981), 67.

summarized the approach of the Saudi leadership to regional events during this timeframe as follows:

> Because of their belief that domestic developments can be seriously affected by events in the Middle East, the Saudis are extremely attentive to the shifts of power and opinion around them. If they believe they can shape those events by drawing on their own resources, they will go to considerable lengths to do so. When the source of danger is beyond their reach – for example, Israel or the Soviet Union – they will urge the United States to act. When all else fails, they will try to remain uninvolved in regional turmoil, adapting as needed to the ebb and flow of events.[335]

From 1973 to 1990, Saudi leadership was confronted with a number of security challenges in the Middle East. Saudi Arabia found itself on the opposite side of the United States during the 1973 Arab-Israeli War. William Quandt asserted that Saudi Arabia sent troops to Syria during the conflict and made offers to Egypt and Syria of economic assistance.[336] According to Quandt, the country also leveraged its power against the United States by stopping oil shipments and reducing its production.[337] Saudi leadership was disappointed in 1977 when Egypt and Israel began direct peace talks, brushing aside Saudi Arabia's plan that involved a united front of Egypt, Syria, Jordan, and the Palestine Liberation Organization.[338] Instead, the U.S.-brokered peace agreement ended up separating Egypt from the rest of the Arab world in terms of its stance against Israel and its statehood.

Saudi Arabia also was confronted with security challenges closer to its own borders. Insecurity reigned between North Yemen and South Yemen. When a conflict broke out between them in 1972, North Yemen received support from Saudi Arabia and South Yemen received support from the Soviet Union.[339] Relations remained tense until the two Yemens united in 1990.

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[335] Ibid., 8.

[336] Ibid., 51.

[337] Ibid.

[338] Ibid., 68.

[339] Thomas W. Lippman, "Yemeni Leaders Meet," *Washington Post*, February 22, 1977, https://www.washingtonpost.com/archive/politics/1977/02/22/yemeni-leaders-meet/4a6afde8-1c20-4471-9e25-d27443141e5b/?utm_term=.d409b086a3bc.

The country cast a wary eye toward Iran as the 1979 revolution threatened to spill revolutionary fervor beyond Iran's borders. Khomeini had stated that Iran intended to export its revolution to the Gulf monarchies.[340] Preoccupied with Iran's possible domestic meddling and activities targeting the Kingdom's small Shia population, Saudi Arabia made the decision to side with Iraq during the Iran-Iraq War. Saudi Arabia assisted Iraq both logistically and financially.[341] During the war, the tense relationship between Saudi Arabia and Iran worsened after Saudi Arabia shot down two Iranian fighter planes over the Gulf.[342] Simmering tensions between Saudi Arabia and Iran came to a head in 1988 when Saudi Arabia broke-off its relations with Iran. It followed a 1987 stampede in Mecca during Hajj that resulted in the deaths of 400 pilgrims that Saudi Arabia blamed on Iran.[343] Saudi Arabia was further provoked by Iranian attacks against Saudi targets.[344] Prior to this break in relations, Saudi Arabia had been trying to improve its relationship with Iran for three years.[345] Relations would not be restored until 1991.

Saudi Arabia and the Gulf States responded to regional instability by forming the Gulf Cooperation Council in 1981. It was originally planned as the current Gulf Cooperation Council member states plus Syria and Egypt. Saudi Arabia remained concerned, however, regarding Syria and Egypt's hegemonic intentions.[346]

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340 Bahgat Korany and Moataz A. Fattah, "Irreconcilable Role-Partners? Saudi Foreign Policy between the Ulama and the US," in *The Foreign Policies of Arab States: The Challenge of Globalization*, ed. Bahgat Korany and Ali E. Hillal Dessouki, Revised Edition (Cairo: American University in Cairo Press, 2010), 380.

341 Henner Fürtig, "Conflict and Cooperation in the Persian Gulf: The Interregional Order and U.S. Policy," *Middle East Journal* 61, no. 4 (2007): 629.

342 Ibrahim Al-Marashi, "Saudi Petro-Nukes?," in *Forecasting Nuclear Proliferation in the 21st Century: Volume 2, A Comparative Perspective*, ed. William Potter and Gaukhar Mukhatzhanova (Palo Alto, CA: Stanford Security Studies, 2010), 85.

343 Ibid.

344 Elaine Sciolinos, "Saudis Break Diplomatic Ties With Iran, Citing Mecca Riots and Gulf Raids," *New York Times*, April 27, 1988, A10.

345 Ibid.

346 Al-Marashi, "Saudi Petro-Nukes?," 89.

In the early 1990s, Saudi relations with Iraq and Iran flip-flopped. Saudi-Iraqi relations deteriorated and Saudi-Iranian relations improved after Iraq invaded Kuwait.[347] To add to Saudi grievances over the invasion, Iraq hit Saudi Arabia with short-range ballistic missiles and cruise missiles when it invaded Kuwait.[348]

Saudi Arabia maintained an important security relationship with Pakistan. Saudi Arabia turned to Pakistan after the turmoil it experienced in the 1970s. Thomas Lippman noted that, after 1979, the year of the Iranian Revolution and Egypt's peace treaty with Israel, "a small contingent of Pakistani troops was deployed to Saudi Arabia. . . . The troops remained until 1987, when oil prices hit historic lows and the Saudis could no longer afford them."[349] Furthermore, U.S. intelligence assessed that as of 1988, Pakistan, along with Egypt and Syria, had received indirect funding for their nuclear programs from Saudi Arabia.[350]

How did the Saudi leadership handle these regional security issues during the 1970s and 1980s? Saudi Arabia used the money from its oil industry to try to influence regional events so that the outcome would be favorable for the Kingdom.[351] Saudi Arabia did not hesitate to use this tactic, whether the focus was to fund North Yemen during its war with South Yemen, the Arab side of the Arab-Israeli conflict, or the Iraqis during the Iran-Iraq War.

b. Nuclear Program

As Saudi Arabia confronted regional instability in the 1970s and 1980s, the country worked to develop its nuclear program. Saudi Arabia established the King

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347 Ibid., 86.

348 "Profile for Saudi Arabia—Missile," Nuclear Threat Initiative, accessed May 25, 2016, http://www.nti.org/learn/countries/saudi-arabia/delivery-systems/; Al-Marashi, "Saudi Petro-Nukes?," 89.

349 Thomas W. Lippman, "Saudi Arabia," in *The Nuclear Tipping Point: Why States Reconsider Their Nuclear Choices*, ed. Kurt M. Campbell, Robert J. Einhorn, and Mitchell B. Reiss (Washington, DC: Brookings Institution Press, 2004), 135.

350 Central Intelligence Agency, Directorate of Intelligence, "Middle East-South Asia: Nuclear Handbook," 63.

351 Korany and Fattah, "Irreconcilable Role-Partners? Saudi Foreign Policy Between the Ulama and the US," 379.

Abdulaziz City for Science and Technology in 1977.[352] According to the organization's website, its purpose was to "coordinate the activities of government institutions and scientific research centers in accordance with the requirements of the development of the Kingdom."[353] The organization was also charged with developing policy in science and technology and recruiting personnel to work there.[354] Nuclear research fell under the mandate of the King Abdulaziz City for Science and Technology.[355]

Saudi scientists began conducting research on the application of nuclear technology for electricity generation and desalination.[356] The IAEA worked with Saudi Arabia on a nuclear energy planning project in the late 1970s.[357] In the 1980s, Saudi scientists looked at possible site locations for nuclear power plants and continued to study the feasibility of using nuclear power for desalination and electricity generation.[358] Also, according to U.S. intelligence, as of 1988, Saudi Arabia had reached out to France, the United States, the United Kingdom, Canada, Sweden, Italy, West Germany, India, Brazil, and Taiwan regarding the purchase of nuclear facilities.[359]

Saudi Arabia created the Atomic Energy Research Institute as a part of the King Abdulaziz City for Science and Technology in 1988 to conduct nuclear research.[360]

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[352] International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran*, 40.

[353] King Abdulaziz City for Science and Technology, "Who We Are," accessed May 25, 2016, http://www.kacst.edu.sa/eng/about/Pages/WhoWeAre.aspx.

[354] Ibid.

[355] International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran*, 40.

[356] Ibid., 41.

[357] Wyn Q. Bowen and Joanna Kidd, "The Nuclear Capabilities and Ambitions of Iran's Neighbors," in *Getting Ready for a Nuclear-Ready Iran* (Carlisle, PA: Strategic Studies Institute, U.S. Army War College, 2005), 57, http://www.strategicstudiesinstitute.army.mil/pubs/display.cfm?pubID=629.

[358] International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran*, 41.

[359] Central Intelligence Agency, Directorate of Intelligence, "Middle East-South Asia: Nuclear Handbook," 63.

[360] International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran.*, 40.

Research at the institute focused on isotopes, nuclear reactors, and nuclear materials among other topics.[361]

In terms of the leadership of Saudi Arabia's nuclear program, U.S. intelligence assessed in 1988 that Saudi King Fahd bid Abdulaziz al Saud was responsible for making decisions on nuclear power development for Saudi Arabia, but relied on his advisors regarding technical matters.[362] It further noted that the King Abdulaziz City for Science and Technology Executive Director Salih Abd al-Rahman was Saudi Arabia's leading expert on nuclear issues and that he favored the development of nuclear power, but not nuclear weapons.[363]

Saudi Arabia's nuclear program remained fairly noncontroversial. What alarmed the international community was the Kingdom's ballistic missile acquisition in 1987. U.S. intelligence noted that Saudi Arabia obtained 40 intermediate-range ballistic missiles, CSS-2 missiles, from China.[364] Jack Anderson and Dale Van Atta reported in the *Washington Post* that the sale was negotiated in 1985, in the middle of the Iran-Iraq War and as other regional states were stockpiling missiles.[365] The CSS-2 missiles could carry a 200 kg high-explosive warhead.[366] The missiles were considered too inaccurate to use with conventional warheads. According to Robert Shuey and Shirley Kan, the missiles had a range of 2,800 km putting Iran, Iraq, and Israel within reach.[367] Israel

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361 Ibid.

362 Central Intelligence Agency, Directorate of Intelligence, "Middle East-South Asia: Nuclear Handbook," 63.

363 Ibid.

364 Director of Central Intelligence, "National Intelligence Estimate, NIE 5–91C: Prospects for Special Weapons Proliferation and Control," 6.

365 Jack Anderson and Dale Van Atta, "Do Saudis Have Nuclear Weapons?," *Washington Post*, December 12, 1990, https://www.washingtonpost.com/archive/lifestyle/1990/12/12/do-saudis-have-nuclear-weapons/bd600932-ab70-4501-8565-d213c0833846/.

366 Director of Central Intelligence, "National Intelligence Estimate, NIE 5–91C: Prospects for Special Weapons Proliferation and Control," 6.

367 Robert D. Shuey and Shirley A. Kan, "Chinese Missile and Nuclear Proliferation: Issues for Congress" (Washington, DC: U.S. Library of Congress, Congressional Research Service, 1994), 3, 1679078762; CH01701, Digital National Security Archive.

subsequently threatened a preemptive strike against the CSS-2s.[368] Shuey and Kan noted that Riyadh held out Iran out as the reason it had acquired the missiles.[369] Following the 1988 break in relations between Iran and Saudi Arabia, when asked if Saudi Arabia might use its Chinese intermediate-range missiles against Iran, Youssef M. Ibrahims reported for the *New York Times* that King Fahd replied: "If we are obliged, we will have no alternative. Our spirit of tolerance should not motivate the Iranians to believe we are so weak. We hope Iran will not stir up trouble because we do not want it to test the ability of our people to defend themselves."[370]

Saudi Arabia's missile acquisition heightened concern in the U.S. Congress regarding the regional missile proliferation trend.[371] In particular, the U.S. Congress expressed concern that China might sell ballistic missiles to Libya.[372] Nevertheless, the regional context at the time of the missile acquisition was important to bear in mind. Ibrahim Al-Marashi noted that missile proliferation was occurring in Egypt, Iran, Iraq, Israel, Libya, Syria, and Yemen.[373] These missiles also served a possible future purpose. Thomas Lippman asserted that if Saudi Arabia ever obtained nuclear warheads, the CSS-2s could be used as a delivery system.[374]

The ballistic missile acquisition also alarmed Egypt. In 1988, the U.S. State Department had to assure Egyptian officials regarding Saudi Arabia's acquisition of the

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368 Shuey and Kan, 3; Dan Fisher, "Israel Trying to Curb Missile Sales to Arabs," *Los Angeles Times*, July 6, 1988, http://articles.latimes.com/1988-07-06/news/mn-5346_1_anti-missile-missile.

369 Shuey and Kan, "Chinese Missile and Nuclear Proliferation: Issues for Congress," 3.

370 Youssef M. Ibrahims, "Saudis Warn They May Use Missiles against Iran," *New York Times*, April 29, 1988, A9.

371 U.S. Department of State, "Department of State's Response to Congressional Concern Regarding Proposed Sale of AWACS to Saudi Arabia," 1988, 1, 1679040291; CH00938, Digital National Security Archive.

372 U.S. Department of State, Bureau of East Asian and Pacific Affairs, "PRC Arms Sales/Arms Sales to Libya (Senator Helms)," 1989, 1, 1679093828; CH01007, Digital National Security Archive.

373 Al-Marashi, "Saudi Petro-Nukes?," 91.

374 Lippman, "Saudi Arabia," 116.

CSS-2 missiles.[375] They relayed Chinese assurances that China had not provided nuclear weapons to any country and that the CSS-2 missiles were only equipped with conventional warheads.[376]

Following the CSS-2 missile acquisition, Saudi Arabia acceded to the NPT in 1988. What drove this choice? Why would Saudi Arabia relinquish the option of a nuclear weapons capability given the surrounding regional threats? Lippman assessed that Saudi Arabia made this decision in order to appease the United States as "penance for a transgression against an indispensable patron."[377]

c. Nuclear Trends

In spite of Saudi Arabia's efforts to establish its nuclear infrastructure, significant progress in this arena did not occur from 1973 to 1990. In 1988, U.S. intelligence assessed that the "lack of human resources and of an organizational framework [were] likely to preclude development of a full-fledged program without a great deal of help from outsiders."[378] The Kingdom did not take significant steps to acquire nuclear technology and equipment that might enable it to obtain a baseline nuclear capability and arm the ballistic missiles. There was also no evidence that the Saudis had acquired nuclear warheads by other means.

What drove Saudi nuclear behavior during this period? According to the information in this section, in the regional context, Saudi Arabia was not directly threatened, but the fact that it was located in a conflict-filled region seemed to have had an impact. Threats from Iran and Iraq at different times were of particular concern. On one hand, Saudi Arabia did not do much to develop its nuclear capability despite its oil wealth. On the other hand, Saudi Arabia opted to acquire intermediate-range ballistic

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375 U.S. Department of State, Bureau of Near Eastern and South Asian Affairs, "Consultations with Egyptian Officials on PRC Role in Middle East," 1988, 1, 1679093844; CH00951, Digital National Security Archive.

376 Ibid.

377 Lippman, "Saudi Arabia," 112.

378 Central Intelligence Agency, Directorate of Intelligence, "Middle East-South Asia: Nuclear Handbook," 63.

missiles from China, even though it was closely allied with the United States. Also, it would have been possible to outfit these missiles with nuclear warheads. Surrounding states such as Egypt had to be assured that they were not equipped with warheads. Given the regional threats, it would have made more sense for Saudi Arabia to acquire short-range ballistic missiles. This choice in ballistic missiles might be interpreted as a signal by Saudi Arabia that it could acquire nuclear weapons if it chose to do so. Perhaps Saudi leadership also assessed that it was an acquisition that its superpower ally, the United States, might tolerate.

6. Syria

Syria looked for ways to bolster its role as a regional leader. Its alliance with the Soviet Union provided access to weapons to equip its military. The country built relationships with militant groups in the Levant combatting Israel. Syria solidified a relationship with Iran by siding with the revolutionary regime during the Iran-Iraq War. After the end of the Cold War, support from the Soviet Union declined. In the early 1980s, Syria worked to launch a civilian nuclear program, but it made little progress due to financial issues or U.S. efforts to thwart its progress. The country was able, however, to expand its ballistic missile program.

a. Political Context

During this time period, Syria sought to maintain domestic stability and pursue a leadership role in the Middle East. Syria used its regional leadership efforts to bolster how the national government was viewed at home. The country's leadership challenges stemmed from the fact that Alawi Muslims dominated the government while the majority of the population was Sunni Muslim. As Hazem Kandil wrote, "the Syrian regime perceives foreign policy, for the most part, as a tool for offsetting the domestic crisis of legitimacy it has been suffering from."[379] What actions did Syria take in pursuit of these goals?

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[379] Hazem Kandil, "The Challenge of Restructuring: Syrian Foreign Policy," in *The Foreign Policies of Arab States: The Challenge of Globalization*, ed. Bahgat Korany and Ali E. Hillal Dessouki, Revised Edition (Cairo: American University in Cairo Press, 2010), 421.

An important aspect of Syrian national identity was its advocacy of Pan-Arabism and its opposition to Israel. Syria briefly united with Egypt in 1958 to become the United Arab Republic. With an eye to recapturing the Golan Heights, Syria joined the Egypt-led Arab coalition that attacked Israel in 1973. In 1978, Syria's president Hafez al-Assad blamed Egypt's negotiations with Israel for the lack of a Middle East peace agreement. Syria, on the other hand, despite a shared border, never made peace with Israel and never recognized it as a state. Hafez al-Assad desired to be equal to Israel militarily. Consequently, between 1967 and 1973, the Syrian army grew from 50,000 to 225,000, reaching 350,000 by the 1990s.[380] This continued opposition to Israel and embrace of the Arab cause bolstered the Syrian government's legitimacy.[381]

Raymond Hinnebusch wrote that Hafez also used "a nationalist foreign policy and Syria's status as a front line state bordering Israel to get aid from the Arab Gulf States and cheap arms from the Soviet Union."[382] Between the superpowers, Syria had closest ties with the Soviet Union. From the 1970s through the mid-1980s, Syria received most of its military equipment from the Soviet Union.[383] In addition, Leonid Brezhnev provided 13,000 military advisors to Syria after signing a treaty between the two countries in 1980.[384] Saudi Arabia provided another source of support. The country provided U.S. $1.6 billion per year to Syria in the 1970s.[385] Then in the 1980s, Saudi Arabia backed Syria's interests in Lebanon in a quid pro quo arrangement involving Saudi economic pursuits.[386]

To strengthen its asymmetric military capability and influence regional issues, Syria supported various terrorist groups, mostly groups targeting Israel. They included

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[380] Ibid., 428.

[381] Raymond Hinnebusch, "Syria: From 'Authoritarian Upgrading' to Revolution?" *International Affairs* 88, no. 1 (2012): 97, https://doi.org/10.1111/j.1468-2346.2012.01059.x.

[382] Ibid.

[383] Kandil, "The Challenge of Restructuring: Syrian Foreign Policy," 433.

[384] Ibid.

[385] Ibid., 445.

[386] Ibid.

Lebanese Hezbollah, Palestinian Islamic Jihad, Hamas, and the Popular Front for the Liberation of Palestine.[387] Consequently, Syria was placed on the U.S. State Department's State Sponsors of Terrorism list in 1979. Syria also built a close relationship with Iran, another state sponsor of terrorism. The foundation for this relationship was laid when Syria quickly sided with Iran during the Iran-Iraq War. In the 1980s, Syria assisted Iran by airlifting weapons along with food and medicine to Iran.[388]

Syria's relationships with the superpowers changed with the decline of the Soviet Union in the late 1980s. On one hand, Syria lost its relative ease of access to modern weaponry from the Soviets.[389] On the other hand, Syria's relations with the United States warmed toward the end of the Cold War. It even joined the U.S.-led coalition against Iraq in 1990 after Iraq's invasion of Kuwait.

b. Nuclear Program

Syria began its nuclear program later than some other states in the region. In 1968, Syria signed the NPT and, in 1969, it was ratified.[390] However, the Syrian Atomic Energy Commission, which the Soviet Union helped organize, did not come into existence until 1976–1977.[391] Soon after, Syria began to examine the possibilities for nuclear power resulting in plans to construct six reactors.[392]

Syria's nuclear efforts were plagued with setbacks. While Syria solicited bids for its nuclear power project from foreign firms in the early 1980s, the resulting contract with

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[387] Holly Fletcher, "State Sponsor: Syria," Council on Foreign Relations, February 1, 2008, http://www.cfr.org/syria/state-sponsor-syria/p9368.

[388] Kandil, "The Challenge of Restructuring: Syrian Foreign Policy," 438–39.

[389] Leonard S. Spector and Deborah R. Berman, "The Syrian Nuclear Puzzle," in *Forecasting Nuclear Proliferation in the 21st Century: Volume 2, A Comparative Perspective*, ed. William Potter and Gaukhar Mukhatzhanova (Palo Alto, CA: Stanford Security Studies, 2010), 104.

[390] "Profile for Syria—Nuclear," Nuclear Threat Initiative, accessed August 10, 2017, http://www.nti.org/learn/countries/syria/nuclear/.

[391] International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran.*, 76; Central Intelligence Agency, Directorate of Intelligence, "Middle East-South Asia: Nuclear Handbook," 69.

[392] International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran.*, 76.

Sofratome of France did not progress to construction due to Syria's inability to pay for the reactor in cash.[393] In 1985, Syria and the Soviet Union signed a bilateral agreement, the Soviet-Syrian Atomic Energy Agreement, which resulted in planning for a research reactor.[394] This deal also fell apart because of financial issues.[395] This lack of momentum led to the 1988 assessment by U.S. intelligence that the program was "beset with financial and technical problems and lacks trained personnel."[396] This was despite the fact that, according to U.S. intelligence, Austria, Brazil, France, India, Italy, Poland, the Soviet Union, Sudan, Turkey, the United States, and West Germany all provided training for Syrian nuclear personnel.[397]

In 1990, Argentina agreed to supply an isotope-production reactor along with fuel for the reactor, according to Richard Kessler.[398] In addition, the International Institute for Strategic Studies noted that Argentina would provide a radiological protection center and a hot cell for radioisotope production.[399] The United States and Israel both expressed concern regarding the agreement, however, and, pressured by these two countries, Argentina did not go through with the sale.[400]

While Syria had little success in building its nuclear program during the 1970s and 1980s, it bolstered its missile capabilities with the aid of the Soviet Union and North Korea. Expanding its missile arsenal gave Syria a way to increase its nonconventional capabilities in its military rivalry with Israel. It was a way that Syria could continue to

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393 International Institute for Strategic Studies, 76; Central Intelligence Agency, Directorate of Intelligence, "Middle East-South Asia: Nuclear Handbook," 69.

394 International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran.*, 76.

395 Ibid.

396 Central Intelligence Agency, Directorate of Intelligence, "Middle East-South Asia: Nuclear Handbook," 69.

397 Ibid.

398 Richard Kessler, "Argentina to Ink Research Reactor Deal Soon with Syria, Says CNEA," *Nucleonics Week* 31, no. 22 (May 31, 1990): 6.

399 International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran*, 77.

400 Ibid.

show regional leadership and mitigate its security concerns. Syria obtained Frog-7 short-range ballistic missiles in 1973 from the Soviet Union and immediately used them in the Arab-Israeli conflict, according to the Nuclear Threat Initiative.[401] It obtained more accurate Scud-B missiles in 1974 from the Soviet Union and later on from North Korea.[402]

In the early 1980s, Syria acquired Scud-C missiles from the Soviet Union and North Korea.[403] The U.S. Department of State noted that North Korea also helped Syria acquire the capability to produce scuds on its own.[404] Syria obtained SS-21 missiles from the Soviet Union in 1983.[405] Thomas Friedman reported that Syria sought to acquire SS-23 missiles from the Soviet Union in 1987, but was unsuccessful.[406] In 1988, the U.S. Congress was deeply concerned that China was considering selling M-9 ballistic missiles to Syria.[407] China asserted, however, that it never transferred these missiles to Syria, according to the U.S. Department of State.[408]

c. Nuclear Trends

Syria made little progress toward improving its nuclear capability during this period due to financial reasons and international opposition to its plans, such as U.S. and

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401 "Profile for Syria—Missile," Nuclear Threat Initiative, accessed July 20, 2015, http://www.nti.org/country-profiles/syria/delivery-systems/.

402 Ibid.; Central Intelligence Agency, Directorate of Intelligence, Nonproliferation Center, "The Weapons Proliferation Threat," 1995, 10, 1679116962; WM00433, Digital National Security Archive.

403 "Profile for Syria—Missile"; Central Intelligence Agency, Directorate of Intelligence, Nonproliferation Center, "The Weapons Proliferation Threat," 10.

404 U.S. Department of State, "North Korean Missile Proliferation," 1997, 3, 1679163402; KO01304, Digital National Security Archive.

405 Bernard Gwertzman, "Black Clouds in Mideast," *New York Times*, October 8, 1983, http://www.nytimes.com/1983/10/08/world/black-clouds-in-mideast-news-analysis.html; "Profile for Syria—Missile."

406 Thomas L. Friedman, "Soviet Cautions Israel Against a New Missile," *New York Times*, July 29, 1987, http://www.nytimes.com/1987/07/29/world/soviet-cautions-israel-against-a-new-missile.html.

407 U.S. Congress, House of Representatives, "Alleged Chinese Sale of Ballistic Missiles to Syria," 1988, 1, 1679094833; CH00958, Digital National Security Archive; Ihsan A. Hijazi, "Arabs Lands Said to Be Turning to China for Arms," *New York Times*, June 24, 1988, http://www.nytimes.com/1988/06/24/world/arabs-lands-said-to-be-turning-to-china-for-arms.html.

408 U.S. Department of State, Bureau of Near Eastern and South Asian Affairs, "China's Missile Sales to the Middle East," 1992, 2, 1679075325; CH01539, Digital National Security Archive.

Israeli opposition to its deal with Argentina. The Assad regime found a way, however, to bolster its defenses against Israel and pursue regional leadership. It did so through strengthening its short-range ballistic missile capabilities and supporting anti-Israel militant groups. Syria was able to find support for its missile program from the Soviet Union and North Korea. Demonstrating its military capabilities within the region served as a way to improve the regime's standing domestically.

What drove Syria's nuclear behavior? In the regional context, Syria's main security concern was Israel. It seemed plausible that Syria would have aggressively pursued a nuclear weapons capability if such a goal were within reach. Syria had little success building a nuclear program, however, due to its own financial and technical limitations and third country opposition to its efforts. External management seemed to play a marginal role in constraining Syria's nuclear efforts.

7. Turkey

Turkey, as the heart of the former Ottoman Empire, used to rule much of the modern Middle East. The country viewed itself as both a part of Europe and the Middle East. Turkey has been a member of the North Atlantic Treaty Organization since 1952 and consequently was protected under the organization's nuclear umbrella. Its security concerns have been primarily domestic; it has battled an insurgency since 1974. Since a few years after Turkey joined the North Atlantic Treaty Organization, the country has pursued a civilian nuclear program. It established two nuclear reactors in the 1970s and 1980s.

a. Political Context

Turkey was the center of the former Ottoman Empire, encompassing much of the Middle East, prior to World War I. After the war, Great Britain, France, and Russia subsequently divided the region into spheres of influence. After World War I, Mustafa Kemal Ataturk founded the Turkish Republic, establishing a democratic, secular, and modern state. He became its first president in 1923.

Turkey sought to stay neutral in World War II, but was eventually drawn in on the side of Allies in 1945, the year that the war ended. After World War II, Turkey continued its close relationship with Europe and became a member of the North Atlantic Treaty Organization in 1952. A primary reason it joined the North Atlantic Treaty Organization was to be protected against Soviet claims over Turkish territory. Turkey's geographic position, abutting the Soviet Union directly, gave it a critical role in the organization during the Cold War. The country served as the alliance's southern flank. Turkey also hosted U.S. nuclear weapons on its soil throughout the Cold War.

Turkey's first military coup occurred in 1960. The country's military traditionally played a strong role in the country's governance. Turkey's military viewed itself as the defenders of the republic's secular, democratic, and western leaning government. It sought to suppress any Islamist political tendencies in Turkey. The military intervened three times before 1991 in the name of stability. In addition to the 1960 military coup, Turkey's military overturned a civilian government in 1971 and 1980.

Another challenge for the Turkish military was confronting the insurgency waged by the Kurdistan Workers' Party. Abdula Ocalan formed the Kurdistan Workers' Party in 1974 in order to fight on behalf of the oppressed Kurdish minority in Turkey. It began armed combat against the Turkish state in 1978. The insurgency evolved into the largest domestic security threat to the country. Turkey's military continued to battle the insurgents throughout the 1980s and 1990s. The fight against the Kurdistan Workers' Party in Turkey led to intermittent conflicts with Iraq, Iran, and Syria due to cross-border security issues involving the Kurdish populations in those countries.

Given Turkey's history, it had a mixed relationship with the Middle East during this period, straddling the European and Asian continents. Turkey did not share a language or ethnicity with the rest of the Arab world. Like the Arab Middle East, however, Turkey was predominantly Sunni Muslim. Also, Turkey quickly recognized the state of Israel after its founding. Thus, while Turkey sought to be a regional leader within its former empire, it avoided becoming deeply ensconced in regional disputes.

b. Nuclear Program

Turkey began working on a civilian nuclear program soon after the "Atoms for Peace" program was launched. The Turkish Atomic Energy Authority was established in 1956, in a similar timeframe to the beginning of the nuclear programs in other Middle Eastern countries. In 1959, Turkey began construction of the Turkish Research Reactor-1, a light water research reactor supplied by the United States.[409] The reactor's highly enriched uranium fuel was provided by the United States as well.[410] The Cekmece Nuclear Research and Training Center was set up in 1961 and housed the Turkish Research Reactor-1. The reactor went critical in 1962, but was shut down in 1977 to be upgraded.[411] In 1966, the Ankara Nuclear Research and Training Center was created. Turkey then began to explore the possibility of using nuclear power for electricity production. The project did not move forward due to the political unrest and the 1971 military coup in Turkey during this period.[412] The country signed the NPT in 1969 and ratified it in 1980. Mustafa Kibaroglu explained the lag in ratification as mostly due to the interest of Iran, Iraq, and Syria in nuclear weapons in the 1970s and that "the Turkish military might not have wanted to give the impression, by means of a hasty ratification, that Turkey would definitely forgo the nuclear option."[413]

As Turkey battled the Kurdistan Workers' Party domestically and suffered through chaos in the national political scene, Turkey sought to advance its civilian nuclear capabilities. The Turkish Research Reactor-1 was upgraded to become the Turkish Research Reactor-2.[414] It was constructed in 1978 and went critical in 1981 and

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409 Research Reactor Database.

410 International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran*, 63.

411 Ibid.

412 Mustafa Kibaroglu, "Lessons from Turkey's Long Quest for Nuclear Power," in *The Nuclear Question in the Middle East*, ed. Mehran Kamrava (New York: Columbia University Press, 2012), 163.

413 Mustafa Kibaroglu, "Isn't It Time to Say Farewell to Nukes in Turkey?" *European Security* 14, no. 4 (2005): 446, https://doi.org/10.1080/09662830500528294.

414 International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran*, 63.

subject to IAEA safeguards.[415] The ITU-Triga Mark II Training and Research Reactor, a reactor also supplied by the United States, was constructed in 1975 and went critical in 1979.[416] It was subject to IAEA safeguards as well.[417] In addition, Turkey sought to move forward again with the acquisition of a nuclear power plant in the late 1970s.[418] This effort was cut short by the Turkish military coup of 1980.[419] After Turkey's second research reactor, the Turkish Research Reactor-2, went critical in 1981, Turkey again tried to create its nuclear energy infrastructure.[420] The renewed effort involved the construction of a nuclear power plant on the Mediterranean coast's Akkuyu Bay, but the project was beset with financial and technical issues.[421]

In the late 1980s, Turkey signed a nuclear cooperation agreement with Argentina to work together to build power reactors and conduct nuclear research.[422] According to Mustafa Kibaroglu, the agreement was of concern to the United States for two reasons: 1) a planned 25MWe research reactor, which could be used for plutonium production and 2) a possible close relationship between Turkey and Pakistan.[423] Kibaroglu noted that rumors had persisted regarding possible, illicit nuclear-related shipments between Pakistan and Turkey.[424] In 1991, upon the urging of the United States and other countries, the joint project with Argentina ended.[425]

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415 Research Reactor Database.

416 Ibid.

417 Ibid.

418 Kibaroglu, "Lessons from Turkey's Long Quest for Nuclear Power," 164.

419 Ibid.

420 Ibid., 166.

421 International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran*, 63.

422 Ibid., 61.

423 Ibid.

424 Kibaroglu, "Lessons from Turkey's Long Quest for Nuclear Power," 165.

425 International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran*, 61.

While Turkey lacked an indigenous nuclear weapons capability, the country hosted U.S. nuclear weapons on its soil beginning in the Cold War.[426] At its peak in 1971, the number of tactical nuclear weapons that the United States had positioned in Europe was 7,300, with Turkey receiving a share.[427] The overall number of U.S. tactical nuclear weapons on the continent was reduced significantly between the beginning and the end of the 1980s, particularly after 1986.[428] During this time period, Turkey itself did not possess ballistic missiles.[429] This would not occur until the mid-1990s.[430]

c. Nuclear Trends

Turkey did not significantly increase its capabilities in nuclear technology and equipment despite its interest in nuclear power. It made halting progress at best during this time period. Nevertheless, Turkey maintained a nuclear weapons capability on its soil due to its North Atlantic Treaty Organization membership.

What drove Turkey's nuclear behavior? Turkey did not seem to be driven to acquire a nuclear weapons capability, in contrast to several other regional states. Turkey did not face significant security threats from regional states. Its greatest perceived threat, a domestic insurgency, could not be resolved by using nuclear weapons. Further, the North Atlantic Treaty Organization covered Turkey under its nuclear umbrella. The country consistently pursued nuclear power initiatives, but fell short on financing and organization to achieve its goals. This leads to the question of how driven Turkey might have been to advance its nuclear capabilities. Perhaps this motivation was lacking.

8. United Arab Emirates

The United Arab Emirates strengthened its relationship with the United States at the beginning of the period following the exit of Great Britain from the Persian Gulf.

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426 Norris and Kristensen, "U.S. Tactical Nuclear Weapons in Europe, 2011," 65.

427 Ibid.

428 Ibid.

429 "Profile for Turkey," Nuclear Threat Initiative, accessed July 21, 2016, http://www.nti.org/learn/countries/turkey/.

430 Ibid.

Regionally, the country supported traditional Arab issues and joined the Gulf Cooperation Council. While the United Arab Emirates did not make significant progress on its nuclear program, it did acquire short-range ballistic missiles from North Korea in the late 1980s.

a. Political Context

The British military withdrew from the Persian Gulf region in 1971 and seven emirates united to form the United Arab Emirates. They consisted of Abu Dhabi, Dubai, Ajman, Fujairah, Sharjah, Ras al-Khaimah, and Umm al-Quwain. Like Saudi Arabia, it had abundant oil and natural gas reserves. Abu Dhabi and Dubai were the wealthiest and most powerful states. The country's president was the ruler of Abu Dhabi and the prime minister was the ruler of Dubai. Decision-making was left to the leadership of the country—the leaders of the seven emirates. Abdul-Monem Al-Mashat described the leadership dynamic as "based on the delegation of power to this small number of individuals in return for generous economic and social rewards including free modern public services such as education, health care, public transportation, etcetera."[431]

The United Arab Emirates identified with the Arab world and was especially close to the other Gulf States. In 1981, it joined the Gulf Cooperation Council in response to regional security issues such as Iran's revolution and the Iran-Iraq War.[432] The United Arab Emirates also consistently supported Arab issues. It opposed Israel and supported the Palestinian cause. According to Abdul-Monem al-Mashat, it supported Egypt and Syria in the 1973 war against Israel and cut oil to the United States due to its support for Israel.[433] The founder of the United Arab Emirates Sheikh Zayed bin Sultan al-Nahyan was quoted in an Arabic-language publication regarding this issue. He stated: "Oil is one

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[431] Abdul-Monem al-Mashat, "Politics of Constructive Engagement: The Foreign Policy of the United Arab Emirates," in *The Foreign Policies of Arab States: The Challenge of Globalization*, ed. Bahgat Korany and Ali E. Hillal Dessouki, Revised Edition (Cairo: American University in Cairo Press, 2010), 463.

[432] Ibid., 469.

[433] Idid., 471.

of the weapons of the battle and it is not more precious than Arab blood. We try to utilize it in favor of the battle. We will use all weapons in the battle."[434]

The United Arab Emirates supported Iraq against Iran during the Iran-Iraq War. The United Arab Emirates had an ongoing territorial dispute with Iran during this timeframe. Iran took three islands in the Persian Gulf in 1971, Greater Tunbs, Lesser Tunbs, and Abu Musa, which were claimed by United Arab Emirates. The United Arab Emirates continued to contest this action.

The United Arab Emirates had a very close relationship with Great Britain as the great power administered the region until the early 1970s. After Great Britain's withdrawal, the United Arab Emirates strengthened its relationship with the United States. The relationship grew even closer as Iraq threatened the Gulf States in 1990 and subsequently occupied Kuwait. The United Arab Emirates conducted joint exercises with the U.S. military in July 1990.[435]

b. Nuclear Program

The United Arab Emirates demonstrated an interest in nuclear energy beginning in the late 1970s, but it did not advance that interest during this period.[436] In terms of the steps it did take, the United Arab Emirates joined the IAEA in 1976. Also, Al Ain University, located in the emirate of Abu Dhabi, hosted a Nuclear Engineering Institute from which it could undertake nuclear-related research.[437] On a more nefarious front, the A.Q. Khan network, Iraq, and Iran used Dubai as a hub for proliferation-related activities, according to the International Institute for Strategic Studies.[438]

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[434] Ibid., 472.

[435] Ibid., 475.

[436] International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran*, 52.

[437] Central Intelligence Agency, Directorate of Intelligence, "Middle East-South Asia: Nuclear Handbook," 73.

[438] International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran*, 55.

In terms of delivery systems, like Saudi Arabia, the United Arab Emirates decided to purchase missiles in the late 1980s. According to U.S. intelligence, the emirate of Dubai purchased between 18 and 24 Scud-B missiles from North Korea.[439] Unlike Saudi Arabia, the United Arab Emirates purchased short-range ballistic missiles rather than intermediate-range ballistic missiles. The United Arab Emirates purchased these missiles after Iraq and Iran showered one another with missiles during the Iran-Iraq War. It may also have been in response to the acquisitions of other regional states, such as Syria and Egypt, which continued to build their missile arsenals, as discussed in previous sections.

c. Nuclear Trends

While the United Arab Emirates, with its oil revenues, undoubtedly had the capital to pursue a nuclear program and a larger missile arsenal, it did not. Rather it limited itself to acquiring two dozen or so missiles from North Korea. Given the ongoing conflicts at the time, it is possible the United Arab Emirates wished to at least demonstrate that it could acquire such capabilities if it chose to do so.

What drove the country's nuclear behavior? The United Arab Emirates had a tradition of relying heavily on Great Britain for security assurances. After the early 1970s, the country seemed to have transferred this reliance to the United States. Despite regional threats of Iran and Iraq, the country did not advance its nuclear program. Its close relationship with the United States seemed to have helped mitigate the security concerns arising from residing in a tumultuous region.

9. Analysis

This chapter has examined the nuclear trends that occurred from 1973 through 1991 and the political contexts in which those trends took place. From this review of nuclear history, it appears that Iraq, Iran, Libya, and Saudi Arabia moved toward nuclear proliferation while Egypt turned away from nuclear proliferation. The remaining countries, Syria, Turkey, and the United Arab Emirates, did not make significant strides

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[439] Director of Central Intelligence, "National Intelligence Estimate, NIE 5–91C: Prospects for Special Weapons Proliferation and Control," 6.

toward or away from nuclear weapons. A summary of the nuclear trends is included in Table 1. Thus, what drove the variation in nuclear proliferation behavior for the region?

Table 1. Summary of Regional Nuclear Trends from 1973 through 1990

Egypt
Decreased nuclear proliferation due to external management.
Iran
Increased nuclear proliferation due to regional rivalry.
Iraq
Increased nuclear proliferation due to regional rivalry.
Libya
Increased nuclear proliferation due to regional rivalry.
Saudi Arabia
Increased nuclear proliferation due to regional rivalry.
Syria
No increase or decrease in nuclear proliferation.
Turkey
No increase or decrease in nuclear proliferation.
United Arab Emirates
No increase or decrease in nuclear proliferation.

B. VARIATIONS IN NUCLEAR PROLIFERATION BEHAVIOR: TESTING TWO THEORIES

Which theory better explains nuclear behavior during this first time period? The first hypothesis is taken from Kenneth Waltz's propositions regarding external management and shifts in the international system.[440] The second hypothesis is taken from T.V. Paul's proposal on proliferation among non-great-power states.

The first hypothesis based on Waltz's work is: *Regional nuclear proliferation should not increase due to the external management of the region by the superpowers during the Cold War*. The alternate hypothesis based on Paul's work is: *Regional nuclear proliferation should increase due to the intensity of regional conflict and rivalry leading to a high-threat security environment. Proliferation is only mitigated if a state receives*

[440] Kenneth N. Waltz, "The Stability of a Bipolar World," *Daedalus* 93, no. 3 (July 1, 1964): 888.

security guarantees or finds a different deterrent. Is there a causal link between external management and no increase in nuclear proliferation or a causal link between regional conflict and rivalry and an increase in nuclear proliferation? In particular, are multiple regional states driving nuclear proliferation or is it the presence or absence of superpower management?

1. Testing Two Theories

The first hypothesis taken from Waltz's work was not confirmed in this first case study. While the second hypothesis, taken from Paul's work, seems to provide a superior explanation for the events that transpired in the Middle East. Nuclear proliferation increased from 1973 to 1990. Iran, Iraq, Libya, and Saudi Arabia all increased their nuclear proliferation efforts causing increased movement toward regional nuclear proliferation. Only Egypt ended its pursuit of nuclear weapons. Thus, an overall regional trend of increased nuclear proliferation characterized this time period.

The empirical evidence presented here indicates that regional conflict and rivalry drove nuclear proliferation trends from 1973 to 1990, despite the presence of a bipolar international system. Egypt's shift away from the pursuit of nuclear weapons occurred after its defeat by Israel in 1973. It was after this defeat that Egypt put forward a plan for a NWFZ in the Middle East. The superpowers helped end a conflict that Egypt and Israel had initiated. Egypt was defeated in a war that it had started. Egypt continued the shift away from nuclear weapons by ratifying the NPT and the IAEA Comprehensive Safeguards Agreement in 1981, after it had signed a peace agreement with Israel in 1979. These actions coincide with the reduction of the threat from Israel and what seems to be a subsequent decision by Egypt to no longer seek a nuclear weapons capability. The rivalry with Israel diminished.

As for the superpowers, the United States and the Soviet Union played key roles in ending the 1973 conflict and the United States led the Camp David Accords in 1978. The United States provided significant financial aid following the signing of the peace agreement. Thus, external management played a critical role in transforming the regional security dynamic. In this context, Egypt's proposal of a regional NWFZ in 1974 and the

NPT ratification and signing the Safeguards Agreement in 1981 were strategic decisions vis-à-vis its rivalry with Israel and its quest for a regional leadership role within parameters acceptable to the superpowers.

When Egypt suffered its 1973 defeat, both Iraq and Libya saw an opening to increase their regional power. Egypt had traditionally played a strong leadership role in the Arab world. When Egypt signed a peace agreement with Israel brokered by the United States, it left a leadership vacuum. Egypt was no longer confronting Israel as forcefully. The acquisition of nuclear weapons by either Libya or Iraq would have served the dual purpose of elevating the country's leadership status in the Arab world and making it much more competitive militarily.

At this time, Iraq and Libya were client states of the Soviet Union. While it did supply the first nuclear reactor and Scud-B missiles to Iraq, the Soviet Union was clear that it did not want Iraq to acquire a nuclear weapon. Iraq's nuclear program shifted forward again after the 1981 attack on Iraq's nuclear reactor at Osirak. The bombing led Iraq to intensify its efforts and aggressively pursue a covert nuclear capability using electromagnetic isotope separation, a uranium enrichment technology that would be easier to conceal. Iraq obtained additional nuclear technology in the 1980s from France, Yugoslavia, and West Germany. Iraq received military assistance from the United States and the Soviet Union during the Iran-Iraq War.

After the war, the United States sought to build bilateral relations with Iraq in order to turn it away from the Soviet Union. While the United States recognized the need to restrict the import of technology and equipment that could be used to build Iraq's capability, it misjudged how much progress had been made in Iraq's pursuit of a nuclear weapon and delivery system. This miscalculation would only be discovered later. In this case as well, external management by the Soviet Union or the United States was not sufficient to deter Iraq's significant progress toward a nuclear weapon despite the fact that Waltz would predict that in a bipolar period the superpowers exert control over their client states.

In terms of a regional driver for Iraq's nuclear proliferation, Iraq was deeply concerned about the threat posed by Iran and Iran's nuclear activities. The Duelfer Report makes it clear that Iran was Iraq's chief security concern and the driver behind nuclear proliferation, especially in the mid- to late 1980s, to the point that Iraq was several years away from a nuclear weapon. The desire for Pan-Arab leadership and a reaction to Israel's emergence as a regional power seem to serve as a greater motivation for Iraq's nuclear efforts in the 1970s.

Libya tried to obtain nuclear technology and even weapons in the 1970s from various countries around the globe. It succeeded in obtaining some training, equipment, and yellowcake in the late 1970s and a research reactor from the Soviet Union in 1980. The Soviet Union insisted, however, that Libya ratify the NPT and the Safeguards Agreement prior to acquiring the reactor. Libya continued its pursuit of nuclear technology and equipment throughout the 1980s. In particular, Libya pushed for a nuclear cooperation agreement with Belgium. Pressure from the United States stopped this agreement from being finalized. Also, negotiations with the Soviet Union for two nuclear power reactors fell through in 1985. The Soviet Union greatly assisted Libya, however, in the running of its Tajura facility.

From these data points, it seems that both the Soviet Union and the United States were involved with monitoring Libya and seeking to deter it acquiring a nuclear weapon. Nevertheless, Libya made progress in a covert manner. For example, in the 1980s, Libya secretly conducted uranium conversion experiments and experiments to create fission product radioisotopes from which it obtained some plutonium. The extent of Libya's efforts would not become known until the 2000s.

In terms of Libya's regional security concerns, unlike Iraq and Iran, Libya did not face an existential threat. Libya was driven to pursue nuclear weapons by its rivalries within the Arab world. In particular, Libya vied with Egypt and Iraq for regional leadership. For Libya, a component of regional leadership was standing up to Israel.

In the case of Iran, the Shah built-up Iran's nuclear infrastructure in the 1970s and was possibly interested in acquiring a nuclear weapon. This coincided with the time that

Iran was seeking to establish itself as a regional hegemon after the departure of the British. The United States had played a key role in helping Iran establish a baseline nuclear capability under the Shah, an ally. Nevertheless, the United States had scrutinized Iranian requests for nuclear reactors and Iran's wish to have the indigenous capability to reprocess spent fuel. Iran's nuclear program stopped temporarily with the fall of the Shah in 1979.

The course of Iran's nuclear program was reversed in 1982 after Iraq attacked the country and the Iran-Iraq War ensued. The existential threat posed by Iraq drove Iran's nuclear proliferation throughout the 1980s. After the Iranian Revolution, Iran had a more challenging time finding foreign partners to help it re-establish its nuclear program. Iran turned to China and the A.Q. Khan network throughout the 1980s for the provision of training and technology for its nuclear program. China, along with Libya, Syria, and North Korea, also aided Iran in developing its delivery systems in the 1980s. The Soviet Union began to assist Iran further with its delivery systems only in the late 1980s. The progress made by Iran during this time period was due to assistance from partners who were willing to aid it behind the backs of the superpowers.

In the case of Saudi Arabia, while the country did not pursue nuclear weapons, it secretly acquired intermediate-range ballistic missiles from China that might have been armed with nuclear warheads.[441] In the regional context, Saudi Arabia faced multiple nuclear weapons programs and missile proliferation efforts. Saudi Arabia procured these missiles despite being a close ally of the United States. Once the news broke of Saudi Arabia's acquisition of the missiles, questions emerged from regional states like Egypt whether the missiles were equipped with nuclear weapons. The United States was put in the difficult position of having to assure its allies regarding Saudi Arabia's nuclear intentions. This case provides another data point regarding lack of superpower control over client states during the bipolar period in regards to proliferation activities.

The United States and the Soviet Union sought to deter regional states from proliferating. While the Soviet Union, and in some instances the United States, provided

441 Lippman, "Saudi Arabia," 116.

nuclear assistance to states, the superpowers simultaneously sought to limit an increase in regional nuclear capability. In fact, the Soviet Union and the United States were in agreement that no country in the region should be able to acquire nuclear weapons. Regardless of the superpowers' efforts, regional states pursued nuclear weapons and made advances toward that goal between 1973 and 1990.

Two key reasons underlie why the superpowers were not able to manage the region during this time period. First, countries like China and Pakistan assisted Middle Eastern states in their nuclear proliferation efforts and China, Argentina, and North Korea assisted states in their missile proliferation efforts. For example, China found eager consumers for nuclear goods in Iraq, Syria, Egypt, and Iran and, in turn, was happy to serve as a supplier.[442] As knowledge of and experience with nuclear technology spread, it became more challenging for the superpowers to control the nuclear supply chain. Countries that deemed it in their interest to promote the spread of nuclear technology found ways to do so.

Second, the superpowers did not have sufficient knowledge regarding the nuclear programs of Iran, Iraq, and Libya. This led them to misjudge the extent of the progress made by these countries. Iraq's efforts to acquire a nuclear weapon before the First Gulf War placed it within several years of accomplishing this goal. What did the superpowers miss? The A.Q. Khan network's assistance to Iran advanced Iran's nuclear program unbeknownst to the superpowers. Iraq chose a uranium enrichment technology, electromagnetic isotope separation, which it believed would escape the attention of the superpowers. Iraq wagered correctly. Libya, despite scrutiny, successfully concealed its enrichment activities from the United States and the Soviet Union. Saudi Arabia surprised the United States with its acquisition of desired missile technology from China.

For this time period, Paul's theory provides greater explanatory power for the region's nuclear proliferation trends. The hypothesis built from Paul's theory predicted the outcome of this period. Specific to Paul's theory, two significant conflict dyads are present: 1) Iraq and Iran and 2) Egypt and Israel. Of the countries examined in this

[442] Garver, *China and Iran*, 141.

chapter, Iraq and Iran both pursued nuclear weapons and Egypt did as well prior to the end of its hostilities with Israel. While Libya was not a part of a significant dyad, Libya's rivalry with its Arab counterparts and with Israel were the main drivers of its nuclear program. Faced with the regional rivalry, Saudi Arabia opted to acquire intermediate-range ballistic missiles. Finally, as will be shown in the next section, Paul's analytical construct holds true for this time period.

In a broad sense, Paul's theory says that regional conflict and rivalry correlates with nuclear proliferation. However, he also provides specific measures in his analytical construct by which to assess a region's propensity for nuclear proliferation. The next part of this section will apply Paul's analytical construct to the Middle East from 1973 to 1990.

2. Analyzing T. V. Paul's Data

After examining different ways of looking at conflict and rivalry, Paul provides a summary of indicators found in conflict situations.[443] He notes that "they are at least five militarized interstate disputes in a twenty-year period, with one or more possibly leading to war, lack of membership in common alliances, and very low levels of economic interaction."[444] Paul summarizes his analytical construct by using the measurements of "militarized interstate disputes/crises" and "economic interdependence" to create the ideal types of high, moderate, and low-conflict regions.[445] As conflict and crisis decrease, interdependence increases and a region moves away from being a high-conflict zone and toward being a moderate-conflict or low-conflict zone.[446] This sub-section examines the data on militarized interstate disputes, regional alliances, and economic interdependence.

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[443] Paul, *Power versus Prudence*, 20.

[444] Ibid.

[445] Ibid., 22.

[446] Ibid.

a. Militarized Interstate Disputes

Paul notes that "the conflict level in a zone may be measured with the following indicators: severity, intensity, duration, and scope of conflicts involving key states, especially the significant dyads in the region, in terms of militarized interstate disputes and crises."[447] He uses the definition by Charles Gochman and Zeev Maoz of militarized interstate disputes, which is "a set of interactions between or among states involving threats to use military force, displays of military force, or actual uses of military force. To be included, these acts must be explicit, overt, nonaccidental, and government sanctioned."[448] This section examines the militarized interstate disputes data from Gochman and Maoz's Correlates of War Project as referenced by Paul.[449] The militarized interstate disputes data demonstrates that the Middle East region was a high-conflict zone during this time period.

The number of militarized interstate disputes occurring between 1973 and 1990 in the region were as follows: Bahrain, 5; Egypt, 25; Iran, 84; Iraq, 56; Israel, 36; Jordan, 5; Kuwait, 13; Lebanon, 5; Libya, 32; Oman, 7; Qatar, 4; Saudi Arabia, 14; Syria, 22; Turkey, 28; United Arab Emirates, 4; and Yemen, 11.[450] The leading states with militarized interstate disputes are Iran and Iraq followed by Israel, Libya, Turkey, Egypt, and Syria. Over this time period, there are clearly more than five militarized interstate disputes in a twenty-year period. There are two sets of significant dyads during this time period: 1) Egypt and Israel and 2) Iraq and Iran. War occurred between both sets. This data confirms the applicability of Paul's characterization of the region as a high-conflict zone.

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447 Ibid., 19.

448 Charles S. Gochman and Zeev Maoz, "Militarized Interstate Disputes, 1816–1976: Procedures, Patterns, and Insights," *Journal of Conflict Resolution* 28, no. 4 (December 1, 1984): 587, https://doi.org/10.2307/173983.

449 Glenn Palmer et al., 2015, "The MID4 Data Set: Procedures, Coding Rules, and Description," in *Conflict Management and Peace Science*, Forthcoming, http://cow.dss.ucdavis.edu/data-sets/MIDs.

450 Ibid.

b. Economic Interdependence

Regarding this second variable, Paul notes that "high levels of economic interdependence characterize a zone of low conflict."[451] Conversely, according to Paul, economic issues do not predominate in interstate relations in zones of high conflict, like the Middle East.[452] Economic interdependence is "measured in terms of trade among the regional states as a percentage of overall imports and exports."[453] How did the Middle East measure-up in terms of economic interdependence, characterized by trade levels within the region over time?

This section examines regional trade data on import and export relationships between each state and the rest of the region in Figure 1 and Figure 2 using data from the International Monetary Fund.[454] This percentage is acquired using the total U.S. dollar amount of trade between each state and the rest of the regional states and the total U.S. dollar amount of trade between each state and the rest of the world.

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451 Paul, *Power versus Prudence*, 21.

452 Ibid., 22.

453 Ibid., 20.

454 International Monetary Fund, Direction of Trade Statistics, accessed August 30, 2015, http://data.imf.org.

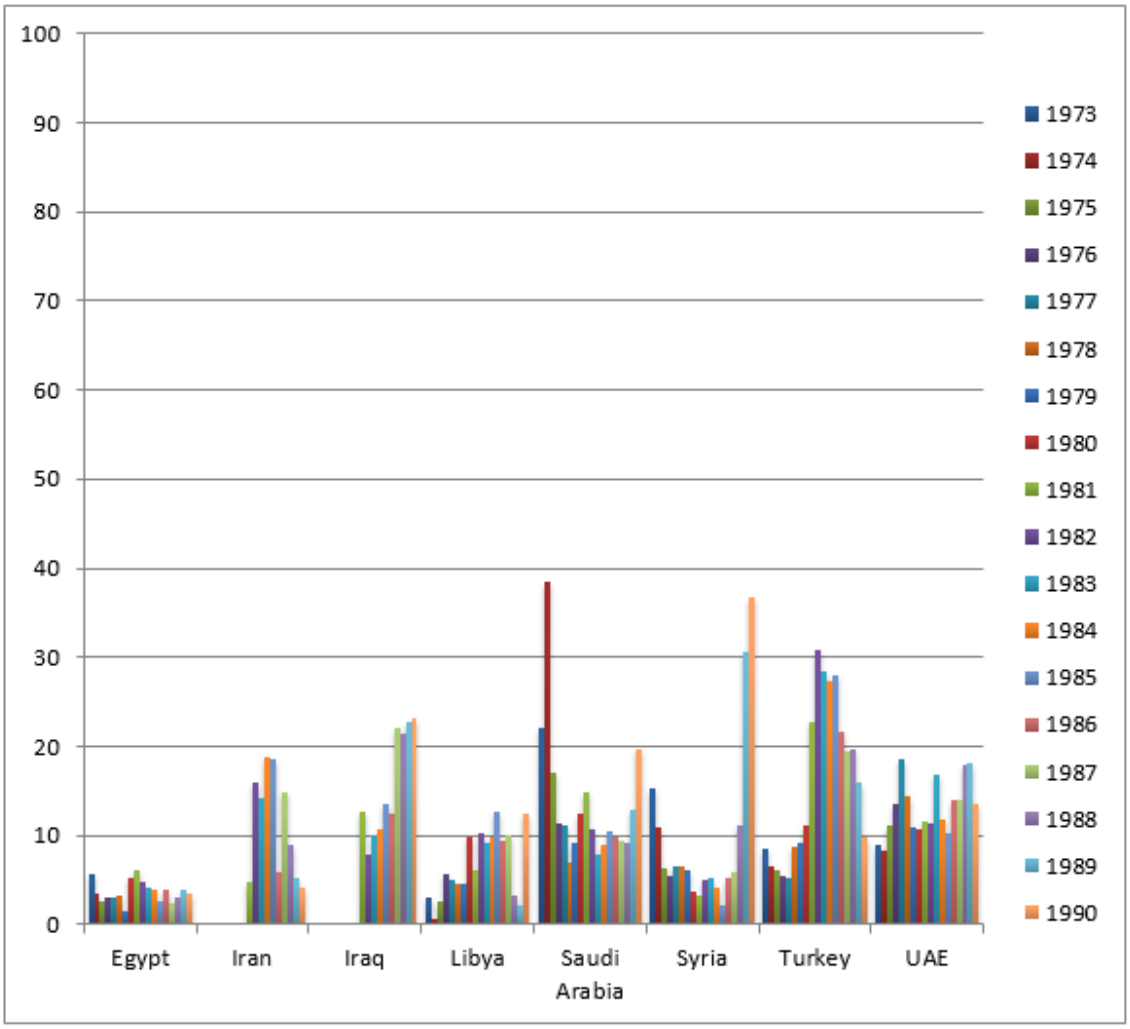

Figure 1. Regional Trade Integration, 1973 to 1990: Exports[455]

Regional export relationships from 1973 to 1990 averaged above 10 percent of trade for Saudi Arabia, Turkey, and the United Arab Emirates.

[455] Source: Data derived from International Monetary Fund, Direction of Trade Statistics.

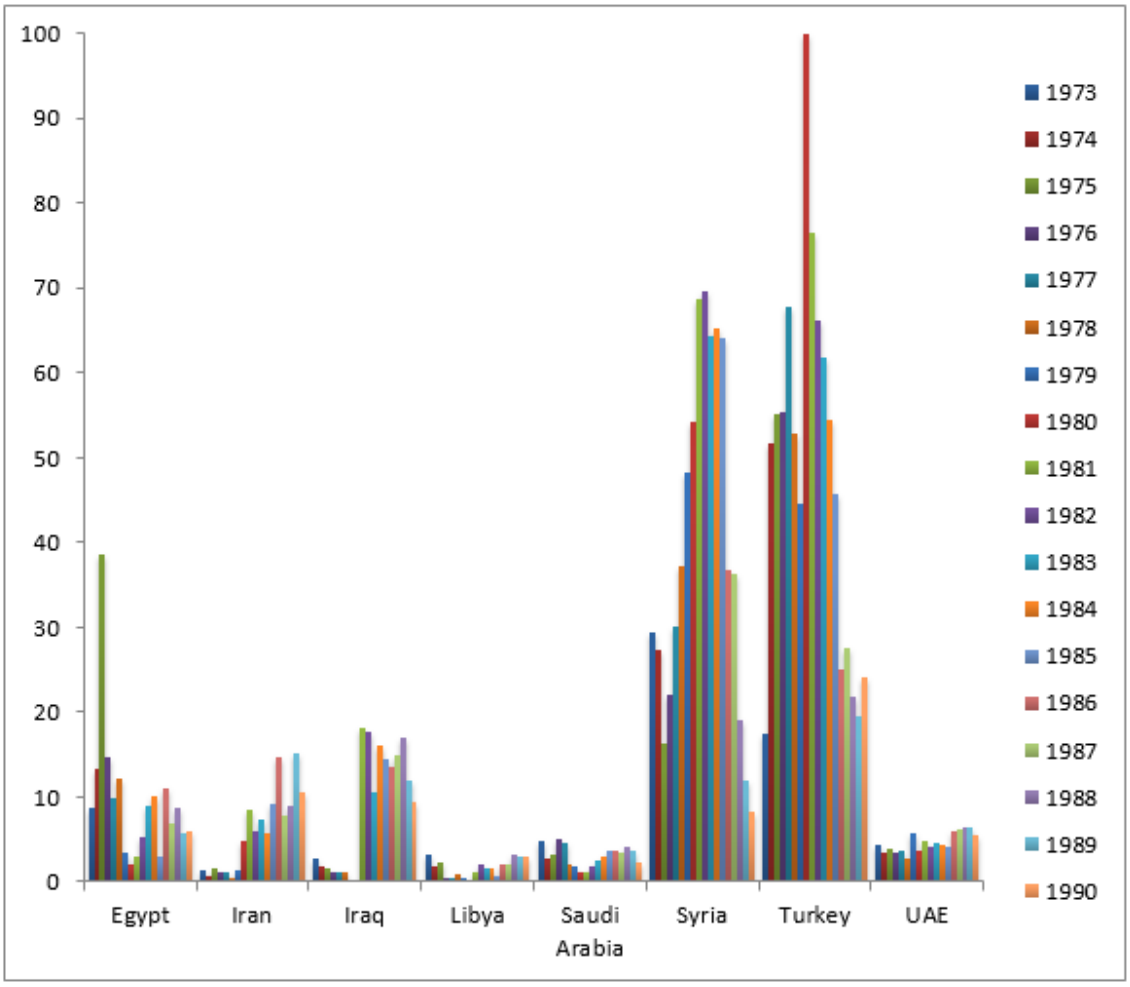

Figure 2. Regional Trade Integration, 1973 to 1990: Imports[456]

Regional import relationships from 1973 to 1990 averaged above 10 percent of trade for only Syria and Turkey. For the remaining countries, regional import relationships consisted of less than 10 percent of trade. Taken together, these statistics demonstrate the lack of economic integration in the region.

c. Regional Organizations and Alliances

Paul also highlights security interdependence in that states belong to regional alliances or economic cooperation organizations. Their level of involvement correlates

[456] Source: Data derived from International Monetary Fund, Direction of Trade Statistics.

with whether they are in a zone of high, moderate, or low conflict.[457] In the latter, states are active members and become increasingly less so as the level of conflict increases.[458] As Paul predicts, a survey of the alliances in the Middle East finds that the states were not well integrated or deeply involved in regional alliances.

For this section, the regional organizations and alliances that were included had to meet the criteria of having existed between 1973 and 1990 and primarily involved regional states. For example, an agreement between Libya and Chad would not have been included as Chad is an African state.

The regional alliances that were in place for all or part of this time period include the Arab League and its accompanying Treaty of Joint Defense and Economic Cooperation between the States of the Arab League, the Central Treaty Organization or Baghdad Pact, the Council of Arab Economic Unity, the Gulf Cooperation Council, the Arab Cooperation Council, and the Economic Cooperation Organization, which replaced Regional Cooperation for Development.

The Arab League was formed in 1945 to cooperate on "matters of economics, communication, culture, nationality, social welfare, and health."[459] The League was sponsored by Great Britain. From the Middle East region as bounded by this study, its original members were Egypt, Iraq, Lebanon, Saudi Arabia, Syria, Jordan, and Yemen, but by 1990 Bahrain, Kuwait, Libya, Oman, Qatar, and the United Arab Emirates were also members with most of them joining in the early 1970s. Additionally, the Treaty of Joint Defense and Economic Cooperation between the States of the Arab League was created in 1950 committing members to defend fellow members against acts of aggression and also promote economic cooperation.[460]

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457 Paul, *Power versus Prudence*, 20–21.

458 Ibid.

459 Jonathan Masters and Mohammed Aly Sergie, "The Arab League," Council on Foreign Relations, October 21, 2014, http://www.cfr.org/middle-east-and-north-africa/arab-league/p25967.

460 "Treaty of Joint Defense and Economic Cooperation between the States of the Arab League," Council on Foreign Relations, accessed February 7, 2016, http://www.cfr.org/middle-east-and-north-africa/treaty-joint-defense-economic-cooperation-between-states-arab-league/p25904.

The Central Treaty Organization or Baghdad Pact was in place from 1955 to 1979. Great Britain and the United States wished for the member states to serve as a buffer between the Soviet Union and the Middle East.[461] Its members were labeled the "northern tier" countries and included Iran, Iraq, Turkey, and Pakistan. The Central Treaty Organization evolved from the 1955 Baghdad Pact, after Iraq withdrew from the pact in 1959. The organization was disbanded entirely after the 1979 Iranian Revolution.

Libya and Syria declared a union of their two countries in September 1980, following the 1979 peace agreement between Israel and Egypt. It was reportedly done in the name of pan-Arabism and as a response to feelings of insecurity following the Camp David Accords.[462] The union, however, did not materialize.

The Gulf Cooperation Council was formed in May 1981. It was a trade bloc of all of the Gulf States except for Yemen. The Council was created after the beginning of the Iran-Iraq War, by Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates. These states claimed that it was in response to a fear of Iran.[463]

The Arab Cooperation Council was formed in 1989 by Egypt, Iraq, Jordan, and the Yemen Arab Republic to promote economic integration.[464] Syria was not included due to the hostility between Iraq and Syria following the Iran-Iraq War.[465] The Council did not last long; it ended after the First Gulf War in 1991.

The Economic Cooperation Organization, founded in 1985, includes Turkey, Pakistan, and Iran. It succeeded the Regional Cooperation for Development organization that was in place from 1964 to 1979. Regional Cooperation for Development provided a

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461 U.S. Department of State, The Office of Electronic Information, "The Baghdad Pact (1955) and the Central Treaty Organization (CENTO)," January 7, 2008, http://2001-2009.state.gov/r/pa/ho/time/lw/98683.htm.

462 Loren Jenkins, "Assad Flies to Libya to Affirm Union," *Washington Post*, September 9, 1980, https://www.washingtonpost.com/archive/politics/1980/09/09/assad-flies-to-libya-to-affirm-union/bc7a4c0e-b759-485a-a4b2-4935e1e3f11e/.

463 Freedman, *A Choice of Enemies*, 155.

464 Curtis R. Ryan, "Jordan and the Rise and Fall of the Arab Cooperation Council," *Middle East Journal* 52, no. 3 (July 1, 1998): 388, https://doi.org/10.2307/4329219.

465 Ibid., 392.

forum for these three Muslim countries to meet and cooperate outside of the Central Treaty Organization.[466] Reaching eastward, the Economic Cooperation Organization added Afghanistan, Azerbaijan, Turkmenistan, Uzbekistan, Tajikistan, Kyrgyzstan, and Kazakhstan as members in 1992.

Of these regional alliance efforts, the only long-lasting alliances were the Arab League and its accompanying Treaty of Joint Defense and Economic Cooperation, the Gulf Cooperation Council, and the Economic Cooperation Organization. The latter included only Turkey and Iran, former "northern tier" states, from the region. The Gulf Cooperation Council promoted economic cooperation among the Gulf States. The alliance that encompassed the greatest number of countries in the Middle East was the Arab League. It was regularly criticized, however, for being dysfunctional and ineffective. It also did not include several important regional non-Arab states – Iran, Turkey, and Israel.

In sum, the data on militarized interstate disputes, economic interdependence, and regional alliances is consistent with how Paul would characterize a high-conflict zone. Paul predicts that states will seek to proliferate in a high-conflict zone and this is what happened in the Middle East in this first case study.

C. CONCLUSION

Returning to the question asked at the beginning of this chapter, were the security dynamics between regional states driving nuclear proliferation or was it the presence or absence of superpower management? Looking at the proliferation drivers during this time period, it becomes clear that regional security dynamics drove nuclear outcomes. Iran, Iraq, Libya, and Saudi Arabia moved toward the acquisition of nuclear weapons and Egypt moved away. The overall regional trend was toward nuclear proliferation.

First, Iran moved toward a nuclear weapons capability during this time period. Iran built its initial nuclear infrastructure under the Shah and it grew until the country's

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[466] S.M. Burke, *Pakistan's Foreign Policy: An Historical Analysis* (London: Oxford University Press, 1973), 305.

1979 revolution. Questions remain as to his true intentions for the program. Statements made to the press in the 1970s indicated that the Shah might have considered acquiring nuclear weapons. The Shah was motivated by the goal of being a regional power. Iran's program moved forward again during the Iran-Iraq War as the country faced an existential threat. Iran restarted its nuclear program in 1982. It worked to develop nuclear weapons in earnest in the mid to late 1980s as it began to secretly acquire centrifuge parts and designs from the A.Q. Khan network.

Second, Iraq sought to acquire nuclear weapons during this time period. It was motivated by regional rivalry with its Arab competitors—Egypt, Libya, and Syria—and Israel. Iran was another source of regional rivalry. Over the course of the Iran-Iraq War, the latter became the primary reason for pursuit of nuclear weapons. Saddam Hussein increased his efforts substantially after the attack on the Osirak reactor. He also sought to use the event politically to attack Iran's regional supporters. The program accelerated toward the end of the war as Iraq worried about Iran's progress. This nearly put Iraq within reach of acquiring a nuclear weapon.

Third, Libya methodically pursued a nuclear weapons capability from the 1970s through the 1990s. Libya also was driven by regional rivalry. It sought to lead the Arab world to contain Israel. While Libya did not face an existential threat from its neighbors, Qaddafi was highly motivated to have his country be the one that acquired the "Arab bomb."

Fourth, Saudi Arabia took a step toward acquiring a nuclear weapons capability by secretly obtaining intermediate-range ballistic missiles that could have been equipped with nuclear warheads. Faced with nuclear and missile proliferation in the region, Saudi Arabia took steps to improve its security situation. The country did this despite being a close Cold War ally of the United States.

Finally, Egypt decreased its nuclear proliferation ambitions after the 1973 Arab-Israeli conflict and the resulting peace agreement. The intensity of regional conflict and rivalry with its neighbor Israel dissipated along with its nuclear weapons ambitions. The United States played a significant role in bringing the peace agreement into place leading

to a decrease in Egypt's threat perception and to Egypt's integration into the nonproliferation regime. The remaining countries, Turkey, Syria, and the United Arab Emirates, did not make significant strides toward a nuclear weapons capability during this time period.

While both the United States and the Soviet Union were involved in regional relations, and at times deeply involved, the evidence points to regional security dynamics as the driver for the increase in nuclear proliferation. Both the United States and the Soviet Union worked to constrain regional nuclear proliferation. The United States, in particular, worked on the nuclear supply side to reduce access to nuclear material and on the demand side to assuage regional security concerns for countries that seemed to have proliferation intentions. For its part, the Soviet Union sought to manage proliferation through insisting on NPT membership and IAEA safeguards as a prerequisite for providing nuclear energy technology.

The presence or absence of external management by the superpowers, however, did not account for the overall regional outcome from 1973 to 1990. The superpowers wanted to deter states from acquiring nuclear weapons, but regional nuclear proliferation proceeded despite the superpowers' efforts. The superpowers also underestimated the level these countries had reached in their proliferation efforts. Further, their management efforts do not explain the shifts or movement toward the acquisition of nuclear weapons. The superpowers were not able to halt or reverse the overall trend of increasing levels of nuclear proliferation in the region.

III. NUCLEAR DISARMAMENT: 1991–2003

Under unipolarity, a time of increased instability in the international system, my international level hypothesis predicted an increase in nuclear proliferation. My regional level hypothesis forecast a downward trend in nuclear proliferation as regional conflict and rivalry eased following the Cold War. I found, however, that levels of conflict and rivalry did not decrease during this period while regional nuclear proliferation did decrease. By the end of this period, Iraq and Libya's nuclear weapons programs had been brought to a halt and Iran had scaled back its coordinated military nuclear program. I also discovered that superpower external management drove this trend.

Kenneth Waltz predicted that unipolarity brought instability to the international system. Instability and security concerns incentivize states to pursue the ultimate deterrent, nuclear weapons. Thus, one would expect an overall increase in regional proliferation. This, however, was not the case. On balance, regional proliferation decreased. At the beginning of the time period, Iran, Iraq, and Libya seemed to be seeking nuclear weapons. Syria appeared to be pursuing a covert nuclear weapons capability in the late 1990s. By the end of 2003, however, the programs of Iraq and Libya had come to an end. Only the programs of Iran and Syria remained and Iran seemed to have temporarily halted its coordinated military nuclear program. In addition, Saudi Arabia took no additional steps toward a nuclear weapons capability.

This is important because it shows that despite concerns by theorists, such as Benjamin Frankel, regarding an increase in nuclear proliferation after the Cold War, the end of bipolarity saw a decrease in nuclear proliferation in one of the most conflict prone regions in the world.[467] And this decrease can be attributed to a less permissive environment for nuclear proliferators under a unipolar international system led by the United States. As the sole superpower, the United States had greater freedom to apply pressure and even force to countries that it believed to be pursuing nuclear weapons.

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[467] Frankel, "The Brooding Shadow: Systemic Incentives and Nuclear Weapons Proliferation."

This chapter explores regional nuclear trends from 1991 through 2003. The First Gulf War marks the period's beginning and the Second Gulf War marks its end. Given the Soviet Union's disintegration in December 1991, this time period is characterized by a unipolar international system dominated by the United States.

The first section explores the history of Middle East states that have attempted or might have made an attempt to acquire nuclear weapons from 1991 through 2003. They include the following: Egypt, Iran, Iraq, Libya, Saudi Arabia, Syria, Turkey, and the United Arab Emirates. It discusses the political context for each country and any efforts to acquire the three major elements for a nuclear program – fissile material, a delivery system, and a nuclear warhead.[468]

The second section uses concepts from Waltz's *Theory of International Politics* to identify to what extent the United States, as the sole superpower, served as an international manager to curtail regional nuclear ambitions. It also examines the hypothesis of regional security dynamics as discussed by T.V. Paul in *Power Versus Prudence* to assess to what extent nuclear behavior is shaped by regional threats, not superpower preference.

A. REGIONAL NUCLEAR HISTORY

As the sole superpower, the United States led a coalition in January 1991 to reverse the Iraqi invasion of Kuwait. While not the original intention of the United States, this First Gulf War and its after effects essentially demolished Iraq's nuclear program. The United States closely followed developments in Iran and Libya's nuclear programs throughout the time period, enacting sanctions against both countries in 1996. On the other hand, the former Soviet Union, now the Russian Federation, initially reduced its nuclear and ballistic missile cooperation with regional states before increasing cooperation toward the end of the time period. Even as Russia shared nuclear technology,

[468] A particularly useful primary source for this time period is a series of unclassified CIA reports written for the U.S. Congress on weapons of mass destruction and advanced conventional weapons. A report was written and presented to congress on this topic once every six months from the mid-1990s through 2003. They outline both acquisition activities and supplier activities and highlight the issues of highest concern to the U.S. intelligence community in this arena.

the country's leadership vowed to the international community that the recipients would not acquire a nuclear weapon. In March 2003, Iraq faced another military coalition led by the United States. This same year Libya publicly renounced its entire nuclear program and opened its nuclear sites for inspection. Finally, Iran also temporarily limited some of its efforts to acquire nuclear weapons in late 2003.

On an international level, what was the impact of this unipolar period on nuclear proliferation trends in the Middle East? What does the historical record say about how the United States, as the sole superpower, viewed its interests and role in the region in regard to nuclear issues? How much control did the United States leverage over the acquisition of nuclear capabilities by Middle Eastern states? How did the United States function as an external manager?

On a regional level, security tensions were reduced from the first time period of 1973 to 1990, but were still present. Iran covertly pursued a nuclear weapons program. The Gulf States nervously eyed Iraq's intentions towards Kuwait and its neighbors and scrutinized Iran's intentions. Turkey watched its southern border with Iraq as the Iraqi Kurds' autonomy grew following the implementation of a "no-fly zone" in 1991 in northern Iraq. Iran and Iraq continued to view each other with mutual suspicion and deemed the other as the greatest security threat they faced. The United States tightened sanctions on Libya throughout the 1990s. While the First Intifada between Israel and the Palestinian Liberation Organization ended in 1993 with the signing of the Oslo Accords, tensions in the Levant persisted. Syria continued its proxy war directed at Israel and its interference in Lebanon's internal affairs. Syria also began to cooperate secretly with North Korea on nuclear issues. Pakistan's A.Q. Khan network continued and expanded covert relationships with Iran and Libya. Meanwhile, Egypt sought to regain a regional leadership role through pushing forward a nonproliferation agenda that would pressure Israel to join the nonproliferation regime.

What was the impact of these regional rivalries on the Middle East? How did these states view their interests and roles in regards to nuclear proliferation? What drove regional nuclear behavior? This chapter begins with an examination of the political background and nuclear developments for Egypt, Iran, Iraq, Libya, Saudi Arabia, Syria,

Turkey, and the United Arab Emirates from 1991 to 2003. The second part of the chapter encompasses an analysis of which theory provides greater explanatory power for the regional nuclear trend. Is the trend better explained by looking at the regional security environment or superpower external management?

1. Egypt

Egypt suffered from significant political and economic turmoil during this period. The government focused on halting domestic attacks by Islamic militants along with economic restructuring. Egypt continued to confront Israel in international settings. Otherwise, the country made limited advances in its civilian nuclear program and did not advance a nuclear weapons program.

a. Political Context

Egypt's regional stature had improved by the 1990s, following the hit it had taken after signing the 1979 peace agreement with Israel. It was in good standing with most of the states in the Middle East, especially following its active role in the First Gulf War liberating Kuwait. Egyptian President Hosni Mubarak joined the U.S.-led coalition and encouraged other Arab states to do the same.

Further, Egypt's economic outlook became brighter. Egypt had come through a tough decade economically in the 1980s when the United States sought coalition partners to remove Iraq from Kuwait. In 1989, Egypt owed about U.S. $50 billion to its creditors.[469] After the First Gulf War, the United States and its allies met in May 1991 to discuss debt forgiveness and financial assistance for Egypt. They decided on a measure to cut Egypt's debts in half to about U.S. $25 billion.[470] As a precursor to this debt forgiveness, Egypt signed an agreement with the International Monetary Fund to restructure its economy. Egypt continued to be the second-largest recipient of foreign aid from the United States.

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[469] Steven Greenhouse, "Half of Egypt's $20.2 Billion Debt Being Forgiven by U.S. and Allies," *New York Times*, May 27, 1991, http://www.nytimes.com/1991/05/27/business/half-of-egypt-s-20.2-billion-debt-being-forgiven-by-us-and-allies.html.

[470] Ibid.

At the same time, Egypt's domestic security situation had grown worse. This time of economic restructuring by Mubarak coincided with an increase in domestic terrorist attacks by Islamic extremists. From 1992 through 1997, there were 1,442 deaths from these attacks, over 10 times the number of deaths in the 1970s and 1980s.[471] The most violent period was from 1993 to 1995, and, according to Michelle Dunne and Scott Williamson, involved "near-daily attacks that included assassinations of government officials and police officers, shootings of tourists, and small bombings."[472] In the worst attack, Islamic militants conducted what was described as a massacre at the Hatshepsut Temple archaeological site near Luxor. The militants shot and killed over 60 people who were mostly foreign tourists.

A political and economic storm ensued. Mubarak turned to his security services to help suppress the Islamist insurgency. Political freedoms were reduced as the security services sought to grapple with the violence enveloping the country. In turn, Egyptian government security efforts against Islamist groups weakened the government's economic endeavors as income gaps exacerbated by the reforms reinforced the Islamists' cause.[473]

Within the region, Egypt generally was seen as a moderate power that maintained good relations with most of the regional states. Egypt maintained friendly relations with its neighbor Libya. It supported efforts to broker a peace agreement between Israel and the Palestine Liberation Organization to include playing an important role in the 1991 Madrid Conference. Syrian-Egyptian relations had been amicable since re-establishing diplomatic relations in 1989. Egypt's ties with Saudi Arabia and the Gulf States remained

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[471] Mohammed M. Hafez and Quintan Wiktorowicz, "Violence as Contention in the Egyptian Islamic Movement," in *Islamic Activism: A Social Movement Theory Approach*, ed. Quintan Wiktorowicz (Bloomington, IN: Indiana University Press, 2004), 71.

[472] Michelle Dunne and Scott Williamson, "Egypt's Unprecedented Instability by the Numbers," Carnegie Endowment for International Peace, March 24, 2014, http://carnegieendowment.org/2014/03/24/egypt-s-unprecedented-instability-by-numbers/h5j3.

[473] Janine A. Clark, "The Paradox of Islamic Activism and Economic Reform in Egypt," *Canadian Foreign Policy Journal* 4, no. 2 (1996): 35, https://doi.org/10.1080/11926422.1996.11014327.

friendly. One reason for this was that Saudi Arabia and other Gulf States had forgiven Egypt's debts of U.S. $6 billion in 1990.[474]

Egypt's relations with Iran and Iraq remained cool. Diplomatic relations with Iraq suffered when Egypt decided to join the 1991 U.S.-led coalition against Iraq and strained relations persisted throughout the 1990s. Also, Egypt's relationship with Iran remained limited. Iran held a grudge against Egypt for a number of reasons. They included making peace with Israel in 1979; allowing the Shah to stay in Egypt until 1980 where he died and was buried; and supporting Iraq in the Iran-Iraq War.

Overall, Egypt maintained a strong domestic focus over this time period because it was preoccupied with internal security threats. Egypt also continued to benefit from its close ties with the sole superpower, the United States. While Egypt maintained a cordial relationship with Russia, the ties between Egypt and the United States were stronger.

b. Nuclear Program

During this period, Egypt worked to expand its work in nuclear research, but made limited progress. In 1992, Egypt purchased a 22MWt light water research reactor, the Experimental Training Research Reactor Number Two, from the Argentinian state-controlled nuclear company, Investigaciones Aplicadas, also known by its acronym INVAP.[475] The reactor operated on 19.75 percent enriched uranium.[476] It reached criticality in 1997 and was placed under International Atomic Energy Agency (IAEA) safeguards.[477] The Atomic Energy Authority of Egypt operated the reactor, which was used for neutron research and radiography.[478] It was also used for medical and nuclear solid-state research, condensed matter research, and nuclear engineering experiments.[479]

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474 Greenhouse, "Half of Egypt's $20.2 Billion Debt Being Forgiven by U.S. and Allies."

475 International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran.* 22.

476 "Profile for Egypt—Nuclear."

477 Research Reactor Database.

478 Ibid.

479 Ibid.

Egypt also undertook unreported nuclear activities throughout the 1990s. The IAEA reported that Egypt conducted experiments "involving the irradiation of small amounts of natural uranium in its reactors to test the production of fission product isotopes for medical purposes" between 1990 and 2003 and did not advise the IAEA.[480] In addition, according to the IAEA, Egypt revealed that the laboratories in the Nuclear Chemistry Building where the irradiated targets were dissolved had not been reported to the IAEA.[481] These activities and the presence of the facilities did not come to light until 2004. The IAEA noted that Egypt claimed the failure to report was due to a misunderstanding regarding its obligations under its Safeguards Agreement, especially in regards to research using only small amounts of nuclear material.[482]

In the early 2000s, Egypt entered into a series of nuclear cooperation agreements, according to Robert Einhorn. They were with Russia, South Korea, and China; although by late 2003 it was not clear what Egypt had derived from these agreements.[483] The agreements may have resulted in assistance with: operating an electronic accelerator, radioisotope production, and uranium mining.[484]

Regionally, Egypt worked to incorporate its nonproliferation agenda into the broader issue of peace in the Middle East. Egypt played a strong supporting role in the Madrid Conference in 1991, which sought to resolve the ongoing Arab-Israeli conflict. The conference was attended by Egypt, Israel, Lebanon, and Syria along with a group consisting of Jordanian and Palestinian delegates and was sponsored by the United States and the Soviet Union.[485] Longer-term outcomes of the conference included the Oslo

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480 International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement in the Arab Republic of Egypt," February 14, 2005, 3, http://www.globalsecurity.org/wmd/library/report/2005/egypt_iaea_gov-2005-9_14feb2005.pdf.

481 Ibid.

482 Ibid., 5.

483 Einhorn, "Egypt," 53.

484 Ibid.

485 U.S. Department of State, Office of the Historian, "The Madrid Conference, 1991," Milestones: 1989–1992, accessed June 14, 2016, https://history.state.gov/milestones/1989-1992/madrid-conference.

Accord between Israel and Palestine in 1993 and an Israeli-Jordanian peace agreement in 1994.[486]

On the nuclear front, another outcome of the 1991 Madrid Conference was the creation of the Arms Control and Regional Security group. Its purpose was to serve as a forum to advance regional security issues and met six times.[487] Progress was stifled, however, due to a conflict between Egypt and Israel as to how the group should proceed to address regional security issues, particularly regarding when to hold talks about a weapons-of–mass-destruction free zone.[488] The group held no further meetings after 1995.[489]

Egypt looked for other ways to pressure Israel. Egypt continued to push for a weapons–of-mass-destruction free zone in the Middle East. It also threatened to withhold its support for the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) permanence at the 1995 NPT Review and Extension Conference given Israel's non-signatory status of the treaty.[490] In further protest, Egypt withheld either signing or ratification of a number of nonproliferation treaties such as the Comprehensive Nuclear Test Ban Treaty, the Chemical Weapons Convention, Biological Weapons Convention, and the Pelindaba Treaty.[491]

While Egypt made only limited progress in expanding its nuclear capabilities, it successfully acquired additional ballistic missiles, especially short-range ballistic missiles, throughout the 1990s.[492] According to the U.S. intelligence community, as of 1998, Egypt sought to acquire the ability to produce Scud-B, Scud-C, and two-stage

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[486] Ibid.

[487] "Arms Control and Regional Security in the Middle East (ACRS)," Nuclear Threat Initiative, accessed December 21, 2017, http://www.nti.org/learn/treaties-and-regimes/arms-control-and-regional-security-middle-east-acrs/.

[488] Ibid.

[489] Ibid.

[490] International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran*, 30.

[491] Ibid., 31.

[492] "Profile for Egypt—Missile."

Vector short-range ballistic missiles along with medium-range ballistic missiles.[493] North Korea and Russia assisted Egypt in these efforts. U.S. intelligence reported that, in the mid-1990s, North Korea and Russia provided Egypt with ballistic missile equipment for its Scud program.[494] U.S. intelligence further noted that North Korea, in particular, maintained a long-standing relationship with Egypt focused on missile development.[495] The country may have aided Egypt in establishing a capability to manufacture Scud-C missiles, according to the Nuclear Threat Initiative.[496] *Arms Control Today* wrote that the United States remained particularly concerned regarding North Korean missile-related transfers to Egypt.[497]

c. Nuclear Trends

Egypt did not increase its nuclear capability significantly from 1991 through 2003. In fact, it seemed to further concede to the nonproliferation regime by eventually giving its support to making the NPT permanent in 1995 and by actively participating in the Arms Control and Regional Security working group. While Egypt continued to have a very active missile program, it did not move forward with the other elements for a nuclear weapons program.

Egypt did maintain some level of latent nuclear capability throughout this period. In fact, its civilian nuclear program was one of the most sophisticated programs in the

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493 Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, January–June 1998," https://www.cia.gov/library/reports/archived-reports-1/jan_jun1998.html.

494 Director of Central Intelligence, "The Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions: July–December 1996," 1997, 4, 1679058490; CH02013, Digital National Security Archive, http://libproxy.nps.edu/login?url=http://search.proquest.com/docview/1679058490?accountid=12702.

495 Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, January–June 1998"; Director of Central Intelligence, "Report of Proliferation-Related Acquisition in 1997," https://www.cia.gov/library/reports/archived-reports-1/acq1997.html.

496 "Profile for Egypt—Missile."

497 "U.S.-North Korean Missile Talks Collapse Following Defection," *Arms Control Today* 27, no. 5 (August 1997): 24.

region.[498] Furthermore, occasional statements by Egyptian leadership reinforced the idea of a purposeful latent nuclear capability. For example, *Al-Hayat* newspaper quoted Mubarak as stating in 1998, "We do not think now of entering the nuclear club because we do not want war . . . .We are not in a hurry. We have a nuclear reactor at Inshas, and we have very capable experts. If the time comes when we need nuclear weapons, we will not hesitate."[499]

What drove Egypt's nuclear behavior? In the regional context, Libya continued to pursue nuclear weapons and Iraq persisted in its efforts to maintain some semblance of a nuclear weapons program. Iran also worked to expand its nuclear capabilities. Nevertheless, Egypt did not reconstitute its weapons program. Rather, Egypt continued to benefit from a close relationship with the United States to include significant financial aid. Given the U.S. opposition to an Egyptian nuclear program, cost-benefit analysis probably led Cairo to believe that it did not make sense for Egypt to pursue such a program. In other words, the incentives from the bipolar period to forego a nuclear weapons program remained.

2. Iran

Iran continued to be heavily involved in regional conflict in the effort to export its Islamic revolution. This activity included supporting terrorist attacks in Latin America, Europe, and the Middle East. Following the September 11, 2001 terrorist attacks against the United States, shifting regional political dynamics favored Iran as U.S.-led coalitions launched military offensives against the governments in Afghanistan and Iraq. Meanwhile, Iran steadily advanced its nuclear capabilities assisted by China, Russia, and the A.Q. Khan network. North Korea worked with Iran to develop its delivery systems.

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[498] International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran*, 24.

[499] As quoted in *Al-Hayat* Arabic-Language newspaper in October 1998 by The Middle East Media Research Institute, "Special Dispatch No. 1299," September 26, 2006, http://www.memri.org/report/en/print1885.htm#_edn10.

a. Political Context

Iran began the 1990s recuperating from losses suffered in the previous decade. The Iran-Iraq War heavily damaged both Iran's human and material capabilities and Iran began to rearm itself.[500] The war also left Iran with a strong sense of vulnerability. Few countries had sided with Iran, other than Libya and Syria. Nearly all of Iran's neighbors and the superpowers had sided with Iraq. Iran had also undergone a leadership change. Iran's Supreme Leader and founder of the Islamic Republic, Ruhollah Khomeini, died in 1989. Ali Khamenei replaced Khomeini, but he was said to have weaker religious credentials and less charisma. Thus, Iran began the time period seeking to re-establish its place in the region and the world.

Iran's continued reliance on asymmetric capabilities to accomplish its security goals also characterized the 1990s, particularly during the tenure of Iranian President Akbar Hashemi Rafsanjani, a conservative politician. During this time period, agents alleged to be backed by Iran carried out multiple terrorist attacks in the region and the world. According to the U.S. Department of State and the U.S. Congress, they included a suicide bombing of the Israeli Embassy in Buenos Aires, Argentina, in 1992, the assassination of four Kurdish dissidents in Berlin, Germany, in 1992, the bombing of a Jewish community center in Buenos Aires in 1994, and the bombing of Khobar Towers, used to house U.S. Air Force personnel in Saudi Arabia in 1996.[501] These attacks reversed any goodwill Iran had gained by helping to negotiate the freedom of U.S. hostage Terry Anderson, an Associated Press reporter, from his Shia militant captors in Lebanon in 1991.[502]

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[500] Spector, *Nuclear Ambitions*, 203.

[501] U.S. Department of State, "Patterns of Global Terrorism: 1997: Overview of State-Sponsored Terrorism" (April 1998), https://1997-2001.state.gov/global/terrorism/1997Report/sponsored.html; *Hearing on the Intelligence Community's Response to Past Terrorist Attacks against the United States from February 1993 to September 2001*, Before the Permanent Select Committee on Intelligence, (October 8, 2002) (statement of Joint Inquiry Staff), https://search.proquest.com.libproxy.nps.edu/dnsa/docview/1679101052/abstract/CAC0BD5992B342B2PQ/1; U.S. Department of State, "Country Reports on Terrorism 2009: Chapter 3: State Sponsors of Terrorism" (U.S. Department of State, August 5, 2010), https://www.state.gov/j/ct/rls/crt/2009/140889.htm; U.S. Department of State, "Patterns of Global Terrorism, 1993: State-Sponsored Terrorism Overview" (U.S. Department of State, April 1994), https://fas.org/irp/threat/terror_93/statespon.html.

[502] Norton, *Hezbollah*, 41–42.

Following the Khobar Towers attack, the United States took a strong stance against Iran's asymmetric activities. U.S. President Bill Clinton signed the Iran-Libya Sanctions Act into law, which imposed sanctions against companies investing heavily in Libya or Iran. A statement from the White House asserted that "the United States Government strongly objects to the unacceptable behavior of Iran and Libya, particularly each regime's support of international terrorism and pursuit of weapons of mass destruction."[503]

Iran also sought to expand its influence in the Levant and in the Israeli-Palestinian conflict by providing support to Hezbollah and other Shia militant groups in Lebanon.[504] The country maintained close ties with its ally Syria. In the Gulf, Iran worked to influence Shia populations, primarily in Bahrain, Iraq, and Saudi Arabia. Finally, Iran incensed the United Arab Emirates in 1992 when it took full control over the disputed island of Abu Musa in the Persian Gulf.[505]

Close to home, Iran kept a wary eye on its neighbors Iraq and Afghanistan. While the First Gulf War diminished the threat from Iraq, Iraq remained determined to rebuild its nuclear program, as discussed in the next section. On Iran's back door in Afghanistan, the Taliban that came to power in 1996 in Afghanistan were no friends of Iran. Iran allied with the Taliban's opponents, the Northern Alliance. Clashes between Iran or Iran-sponsored groups and the Taliban continued between 1996 and 2001. Tensions peaked in the 1997–1998 timeframe due to the following incidents: 1) the Taliban closed the Iranian Embassy in Kabul in 1997 and accused Iran of interference; and 2) in 1998, following a battle between the Taliban and the Northern Alliance where Iran had provided support to the latter, the Taliban killed 2,000 male members of the Hazara, Tajik, and Uzbek communities and kidnapped and killed eight Iranian diplomats in

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503 Jerry Gray, "Foreigners Investing In Libya or in Iran Face U.S. Sanctions," *New York Times*, July 24, 1996, http://www.nytimes.com/1996/07/24/world/foreigners-investing-in-libya-or-in-iran-face-us-sanctions.html.

504 U.S. Department of State, "Patterns of Global Terrorism: 1997: Overview of State-Sponsored Terrorism."

505 This territorial dispute dated back to the late 1960s when Iran, under the Shah, claimed the islands of Abu Musa and Upper and Lower Tunbs from the United Arab Emirates as the British withdrew their security presence from the region.

Mazar-i-Sharif.[506] As a result, Iran began massing troops along its border with Afghanistan.[507] With the United Nations (UN) interceding, Iran decided against invading its neighbor.[508] Iran continued to provide support to the Northern Alliance against the Taliban government in Afghanistan.

The political climate in Iran shifted in the mid-1990s and Iran improved its regional relations. Mohammad Khatami, a reformist, assumed the presidency in 1997. Khatami strove to open up Iran politically and called for a "dialogue of civilizations."[509] Vali Nasr wrote that, under Khatami, Iran focused on "a pragmatic diplomacy emphasizing trade, reconciliation with erstwhile foes such as Saudi Arabia, and mutual security compacts."[510] For example, Iran sought to better bilateral relations with Russia and the Gulf States. Khatami met with Russian President Vladimir Putin in Moscow in May 2001 and signed a security cooperation agreement.[511] It was the first broad cooperative agreement between Russia and Iran since Iran's 1979 revolution.[512] The attendance of Saudi Crown Prince Abdullah bin Abdulaziz and Kuwaiti Emir Shaykh Jabir al-Ahmad al-Sabah at the 1997 Organization of the Islamic Conference signaled improved relations between Iran and both of these countries.[513]

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506 Mohsen M. Milani, "Iran's Policy towards Afghanistan," *Middle East Journal* 60, no. 2 (2006): 244.

507 Douglas Jehl, "Iran Holds Taliban Responsible for 9 Diplomats' Deaths," *New York Times*, September 11, 1998, http://www.nytimes.com/1998/09/11/world/iran-holds-taliban-responsible-for-9-diplomats-deaths.html.

508 Jehl.

509 Douglas Jehl, "Iranian President Calls for Opening Dialogue with U.S.," *New York Times*, December 15, 1997, https://www.nytimes.com/1997/12/15/world/iranian-president-calls-for-opening-dialogue-with-us.html.

510 Vali Nasr, *The Dispensable Nation: American Foreign Policy in Retreat* (New York: Anchor, 2014), 100.

511 "Russia Backs Iran Nuclear Programme," *BBC News*, March 12, 2001, http://news.bbc.co.uk/2/hi/middle_east/1215606.stm.

512 Ibid.

513 Martin Kramer, "The Islamic Summit in Tehran: Beyond the Hype" (Washington, DC: Washington Institute, December 9, 1997), http://www.washingtoninstitute.org/policy-analysis/view/the-islamic-summit-in-tehran-beyond-the-hype.

Iran also moved to improve relations with the United States. In a 1998 interview with *CNN News*, Khatami called for opening a dialogue between the United States and Iran.[514] The United States sought to reciprocate. This led to U.S. Secretary of State Madeleine Albright responding in 2000 by: 1) acknowledging errors such as U.S. support for the 1953 coup that overthrew democratically elected Prime Minister Mohammed Mosaddeq and 2) ending some economic sanctions against Iran.[515] Later, when Al-Qaeda terrorists attacked the United States on September 11, 2001, the press widely reported that both Supreme Leader Khamenei and President Khatami condemned the terrorist attacks against the United States.

After the September 11 attacks, the United States partnered with the Northern Alliance, Iran's ally, to oust the Taliban from power. This decision meant the tide in Afghanistan was turning in Iran's favor. Iran's Supreme Leader Khamenei approved official outreach to the United States.[516] Iran offered tactical support and to facilitate support to the Northern Alliance.[517] Furthermore, Iran supported the Bonn process that would establish the new Afghan government after the fall of the Taliban.[518] Iran's goodwill toward the United States ended in 2002, however, when it was named as one of the three members of the "Axis of Evil" during the State of the Union address by U.S. President George W. Bush.[519]

In spite of the 2002 speech, Iran allegedly reached out to U.S. leadership in early 2003—the same timeframe as the beginning of the Second Gulf War. Flynn Everett, a

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514 Steven Erlanger, "U.S. Aides Warm Up to Informal Iran Ties," *New York Times*, January 10, 1998, http://www.nytimes.com/1998/01/10/world/us-aides-warm-up-to-informal-iran-ties.html.

515 David E. Sanger, "U.S. Ending a Few of the Sanctions Imposed on Iran," *New York Times*, March 18, 2000, http://www.nytimes.com/2000/03/18/world/us-ending-a-few-of-the-sanctions-imposed-on-iran.html.

516 Nasr, *The Dispensable Nation*, 100.

517 Ibid.

518 Ibid.

519 David E. Sanger, "The State of the Union: The Overview; Bush, Focusing on Terrorism, Says Secure U.S. Is Top Priority," *New York Times*, January 30, 2002, https://www.nytimes.com/2002/01/30/us/state-union-overview-bush-focusing-terrorism-says-secure-us-top-priority.html.

former National Security Council official for the Bush Administration, stated that Iran's Foreign Ministry had sent "a detailed proposal for comprehensive negotiations to resolve bilateral differences" and "acknowledged that Iran would have to address concerns about its weapons program and support for anti-Israeli terrorist organizations" in 2003.[520] The letter reportedly was sent through the Swiss and poorly received in Washington.[521]

The United States also began to focus on removing Iran's mortal enemy in Baghdad, Iraq, the regime of Saddam Hussein. Geopolitically, regional events were favoring Iran, although the U.S. military's eventual occupation of Iraq remained a strategic threat.

b. Nuclear Program

While Iran continued its asymmetric warfare against the United States, Israel, and other targets in the early 1990s, it aggressively expanded its nuclear and missile programs. As early as March 1992, Director of Central Intelligence Robert Gates stated in congressional testimony that Iran was seeking nuclear weapons.[522] As of 1996, the U.S. intelligence community believed that Iran was "one of the most active countries seeking to acquire WMD and ACW technology from abroad."[523] This language was used consistently to describe Iran in congressionally mandated weapons of mass destruction reports provided by U.S. intelligence from late 1996 through mid-2001. In late 2001, the language was even stronger. It changed to "Iran is vigorously pursuing programs to produce indigenous WMD—nuclear, chemical, and biological—and their delivery

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[520] Flynt Leverett, "The Gulf between Us," *New York Times*, January 24, 2006, sec. Op-Ed, http://www.nytimes.com/2006/01/24/opinion/the-gulf-between-us.html.

[521] Ibid.

[522] *Worldwide Threats to United States Security*, Hearings Before the Armed Services Committee Defense Policy Panel, House of Representatives, 102nd Congress, 317 (1992) (testimony of Robert Gates, Director, Central Intelligence Agency), http://www.loc.gov/law/find/nominations/gates/007_excerpt.pdf.

[523] Director of Central Intelligence, "The Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions: July–December 1996."

systems as well as ACW."[524] Further, the 2001 report reiterated that Iran was pursuing nuclear weapons.[525]

Based on the language in the reports, there appeared to be little doubt within the U.S. intelligence community regarding Iran's nuclear intentions. This language regarding U.S. certainty about Iran's pursuit of a clandestine weapons program continued through the end of the reporting series in December 2003.[526] While U.S. intelligence seemed to believe that Iran likely was pursuing nuclear weapons throughout the 1990s, by late 2001, it appeared to be convinced that this was the case. While these unclassified reports to Congress indicated that the nuclear programs of Libya and Iraq were on Washington's radar, Iran appeared to be of highest concern in terms of its actual acquisition activities. What happened in Iran from 1991 through 2003 to warrant this level of attention and concern from the United States? The story involves Iran and its suppliers – entities in China, Russia, and Pakistan among others.

China was a consistent nuclear supplier for Iran through the mid-1990s. China helped Iran build four new nuclear research reactors.[527] Construction of the Esfahan Nuclear Technology Center Light Water Sub-Critical Reactor began in 1988 and it started operating in 1992.[528] The Esfahan Nuclear Technology Center Graphite Sub-Critical Reactor was constructed in 1991.[529] The Esfahan Nuclear Technology Center Heavy Water Zero Power Reactor was constructed in 1991 and reached criticality in 1995.[530] The Esfahan Nuclear Technology Center Miniature Neutron Sources Reactor,

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[524] Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, July–December 2001," https://www.cia.gov/library/reports/archived-reports-1/july_dec2001.htm.

[525] Ibid.

[526] Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, July–December 2003," accessed March 7, 2016, https://www.cia.gov/library/reports/archived-reports-1/721report_july_dec2003.pdf.

[527] "Nuclear Power in Iran."

[528] Research Reactor Database.

[529] Ibid.

[530] Ibid.

another light water research reactor, was constructed in 1991 and reached criticality in 1994.[531] These reactors were operated by the Esfahan Nuclear Technology Center and placed under IAEA Safeguards.[532] In addition, Iran and China signed a ten-year nuclear agreement in 1990.[533] Under this agreement, China trained nuclear technicians and engineers and provided two "mini" research reactors for its Esfahan nuclear site.[534] In 1991, China agreed to finish building the nuclear power plant in Bushehr, according to John Garver.[535] Garver further noted that China sent 1,600 kg of uranium products to Iran that enabled Iran to familiarize itself with the nuclear fuel cycle.[536]

China's assistance to Iran raised concerns within the U.S. government. In 1991, a U.S. Senate letter to the U.S. Secretary of State expressed apprehension about China helping Iran's nuclear weapons development.[537] It stated "China has reportedly provided Iran with equipment, including calutron devices, capable of making fissile material."[538] In fact, according to Garver, in 2003, China would admit to providing Iran with a calutron in 1989 and a 27-KW reactor in 1991.[539]

The United States began confronting China regarding its role as a nuclear supplier for Iran. Cirincione, Wolfsthal, and Rajkumar wrote that in 1992, the United States was able to convince China to forego selling a research reactor to Iran that would produce plutonium.[540] They additionally noted that in 1992, China said it would provide Iran with two 300-MW electric nuclear power reactors, but the sale was suspended in 1995,

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[531] Ibid.

[532] Ibid.

[533] Cirincione, Wolfsthal, and Rajkumar, *Deadly Arsenals*, 303.

[534] Ibid.

[535] Garver, *China and Iran*, 147.

[536] Ibid., 146–47.

[537] U.S. Congress—Senate, "Issues to Raise with Chinese Leaders," 1991, 1, 1679055294; CH01450, Digital National Security Archive, http://libproxy.nps.edu/login?url=http://search.proquest.com/docview/1679055294?accountid=12702.

[538] Ibid., 1.

[539] Garver, *China and Iran*, 147.

[540] Cirincione, Wolfsthal, and Rajkumar, *Deadly Arsenals*, 303.

possibly due to U.S. pressure.[541] Garver added that China entered into negotiations with Iran to provide a 25 to 30-MW heavy-water reactor in 1992, but an agreement was never concluded, also possibly as a result of U.S. pressure.[542]

The United States continued to make headway in persuading China to end nuclear cooperation with Iran. Garver outlined these efforts noting that, in 1996, Iran advised the IAEA of a sales agreement for a uranium hexafluoride conversion plant from China.[543] He asserted that the United States began government-to-government talks with China to halt this sale, and, as a result, the United States and China came to an agreement in October 1997 regarding China's nuclear cooperation with Iran.[544] As part of this agreement, China agreed not to sell "nuclear power plants, a uranium hexafluoride plant, heavy-water reactors, or a heavy-water production plant to Iran," according to Garver.[545] U.S. intelligence reported that China agreed to forego future nuclear cooperation efforts with Iran, but insisted on finishing two tasks it had already started working on—a zirconium production facility and a nuclear research reactor.[546] In addition, according to U.S. intelligence, new regulations governing the export of dual-use nuclear equipment were created and implemented in China in 1998.[547] Nevertheless, Chinese compliance was not perfect. U.S. intelligence noted in 2002 that Iran continued to take advantage of "specialized weapons services and lower prices that China and North Korea offered."[548]

As the United States gained ground in its efforts to reduce Chinese cooperation with Iran, Russia increased its assistance to Iran. This post-Soviet Union relationship

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[541] Ibid.

[542] Garver, *China and Iran*, 151.

[543] Ibid., 152.

[544] Ibid., 153.

[545] Ibid., 154.

[546] Director of Central Intelligence, "Report of Proliferation-Related Acquisition in 1997."

[547] Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, January–June 1998."

[548] Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, January–June 2002," https://www.cia.gov/library/reports/archived-reports-1/721report_jan-june2002.pdf.

began in 1992 when Iran signed a nuclear cooperation agreement with Russia.[549] In 1995, after China demurred to complete construction of the Bushehr power plant, Russia announced that it would finish the project.[550] Garver noted that after the suspended sale of a heavy-water reactor in 1995, Iran moved ahead in 1996 to build the heavy-water Arak reactor assisted by Russia.[551] U.S. intelligence assessed that Russian entities worked with Iran on various nuclear projects including selling laboratory equipment and building a 1,000 MW nuclear power reactor located in Bushehr.[552] U.S. intelligence further noted that while Russia insisted that the nuclear technology it was sharing was not useful militarily, the United States remained concerned that it would help Iran develop nuclear weapons.[553] John Parker asserted that proliferation to Iran became worse in the mid-1990s despite the efforts of the Yeltsin administration to improve export controls.[554] He attributed this to the efforts of Viktor Mikhaylov, the head of the Russia's Ministry of Atomic Energy, who used the Bushehr project as a cover for sales of hazardous equipment to Iran.[555]

By the late 1990s, Russia's nuclear cooperation with Iran had begun to wane.[556] Under pressure from the United States, a new export control law passed in the Duma in 1999.[557] The weakness of the law, however, was that it was not properly enforced and economic hardship motivated companies to circumvent the controls.[558] Frustrated over these remaining gaps in the nuclear supply chain, in 1999, the United States put sanctions

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549 "Nuclear Power in Iran."

550 Cirincione, Wolfsthal, and Rajkumar, *Deadly Arsenals*, 304.

551 Garver, *China and Iran*, 151.

552 Director of Central Intelligence, "Report of Proliferation-Related Acquisition in 1997."

553 Ibid.

554 Parker, *Persian Dreams*, 104.

555 Ibid.

556 Ibid., 105.

557 Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, January–June 1999," https://www.cia.gov/library/reports/archived-reports-1/jan_jun1999.html.

558 Ibid.

in place against Russian companies involved with assistance to Iran's nuclear and missile programs.[559] In spite of the sanctions, Russia continued to fail to enforce all of its export controls for Iran and Iran continued to develop its nuclear capabilities, according to U.S. intelligence.[560] U.S. intelligence further noted that, in 1999, the Ministry of Atomic Energy contracted with Iran to provide Atomic Vapor Laser Isotope Separation equipment, in spite of U.S. protests.[561] U.S. intelligence assessed that the equipment could allow Iran to produce highly enriched uranium for nuclear weapons.[562] Iran conducted laser enrichment experiments between late 2002 and early 2003, utilized 22 kilograms of natural uranium metal, and yielded a few milligrams of reactor-grade enriched uranium, according to Cirincione, Wolfsthal, and Rajkumar.[563] They noted that the uranium used for these experiments likely came from Russia in 1993 and had not been declared; however, Iran claimed that these experiments ended in 2003.[564]

What drove the Russia-Iran relationship? Parker assessed that, "at its core, the Russian impulse to sell Iran conventional arms and to contract to build the Bushehr nuclear power plant was commercial."[565] Commercial interests and the ability to withstand U.S. pressure allowed Russia, along with China, to become an important nuclear supplier to Iran.

In addition, Iran attempted to exploit the disorder following the break-up of the Soviet Union to acquire nuclear technology. In 1996, U.S. intelligence assessed that Iran sought "to develop the capability to produce both plutonium and highly enriched uranium" and "launched a parallel effort to purchase fissile material, mainly from sources

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559 Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, July–Dec 1999," https://www.cia.gov/library/reports/archived-reports-1/july_dec1999.htm.

560 Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, July–December 2000," https://www.cia.gov/library/reports/archived-reports-1/july_dec2000.htm.

561 Ibid.

562 Ibid.

563 Cirincione, Wolfsthal, and Rajkumar, *Deadly Arsenals*, 301.

564 Ibid.

565 Parker, *Persian Dreams*, 105.

in the former Soviet Union."[566] As supporting evidence, U.S. intelligence cited two examples:

> Iranian agents have contacted officials at nuclear facilities in Kazakhstan on several occasions, attempting to acquire nuclear-related materials. For example, in 1992, Iran unsuccessfully approached the Ulba Metallurgical Plant to obtain enriched uranium.[567]
>
> In 1993, three Iranians believed to have had connections to Iran's intelligence service, were arrested in Turkey while seeking to acquire nuclear material from smugglers from the former Soviet Union.[568]

Pakistan's A.Q. Khan network proved to be another important nuclear supplier to Iran. Iran claimed that in 1993 it received an offer from the network for 500 P-1 centrifuges and P-2 centrifuge drawings, according to David Albright.[569] Albright noted that Iran received the P-1 centrifuges along with design documents at a meeting in Dubai in 1993 or 1994.[570] Albright also asserted that, in 1996, Iran received a set of P-2 centrifuge drawings from the network.[571] Iran insisted that it then went on to manufacture all P-2 components in country and did not import them, according to Cirincione, Wolfsthal, and Rajkumar.[572] They assessed that the technology provided by A.Q. Khan in the 1990s helped Iran leapfrog forward in its work on uranium centrifuges.[573] Incidentally, according to Cirincione, Wolfsthal, and Rajkumar, Iran had sought to acquire a whole centrifuge facility from Russia in a similar timeframe, but had not been successful due to U.S. pressure on Russia.[574] Albright asserted that, in 2002,

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566 *Testimony Before the Permanent Subcommittee on Investigations of the Senate Committee on Government Affairs by the DCI*, Senate, 102nd Congress, (March 20, 1996) (testimony of John M. Deutch, Director of Central Intelligence), https://www.cia.gov/news-information/speeches-testimony/1996/dci_testimony_032096.html.

567 Ibid.

568 Ibid.

569 Albright, *Peddling Peril*, 96.

570 Ibid.

571 Ibid., 97.

572 Cirincione, Wolfsthal, and Rajkumar, *Deadly Arsenals*, 299.

573 Ibid.

574 Ibid.

Iran constructed and tested P-2 centrifuges based on the designs obtained in 1996.[575] This led the U.S. intelligence community to assess in late 2003 that Iran had benefited greatly from the A.Q. Khan network's assistance as it developed its nuclear program.[576] The network proved to be a nuclear supplier that operated under the radar of the international community allowing Iran to advance its nuclear program.

Separately, Iran received assistance from Argentina. In 1992, the United States halted a deal between Argentina and Iran.[577] According to the Nuclear Threat Initiative, the deal would have provided for facilities for heavy-water production and uranium enrichment.[578] In addition, Argentine company INVAP converted the Tehran Research Reactor to operate on low enriched uranium rather than highly enriched uranium and it began operating on low enriched uranium in 1993.[579]

Throughout this time period, the United States worked to halt Iran's acquisition of nuclear technology. In 1996, U.S. intelligence assessed that "numerous interdiction efforts by the U.S. government have interfered with Iranian attempts to purchase arms and WMD-related goods, but Iran's acquisition efforts remain unrelenting."[580] Further, U.S. intelligence had reason to believe that Iran had created a network of military and civilian organizations to assist its weapons development efforts.[581]

In 2002, the international political climate surrounding Iran's nuclear program grew worse for Iran. In August 2002, the Iranian dissident group the Mujahedeen-e Khalq announced that Iran was constructing facilities for nuclear fuel and heavy water

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575 Albright, *Peddling Peril*, 97.

576 Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, July–December 2003."

577 Cirincione, Wolfsthal, and Rajkumar, *Deadly Arsenals*, 303.

578 "Profile for Iran—Nuclear."

579 "Nuclear Power in Iran."

580 Director of Central Intelligence, "The Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions: July–December 1996," 4.

581 Director of Central Intelligence, "Report of Proliferation-Related Acquisition in 1997."

production.[582] According to U.S. intelligence, satellite imagery showed that the latter was a Natanz-based facility for uranium enrichment.[583] After the Mujahedeen-e Khalq's outing of the secret facility, Iran announced to the IAEA that it planned to develop the entire fuel cycle and the IAEA requested access to the Natanz facility to look for possible safeguards violations.[584] In late 2002, the U.S. intelligence noted:

> Although Iran claimed that its nascent enrichment plant is to produce fuel for Bushehr and other future power reactors, we remained convinced that Iran's true purpose was to develop fissile material production capabilities for nuclear weapons. Even if Iran allowed intrusive IAEA safeguards inspections at Natanz, there is a serious risk that Iran could use technology developed there to build a separate covert facility. Although Iran claimed its heavy water plant was for peaceful purposes, Iran has no large heavy water reactors for which it would need such amounts of heavy water. We believe Iran was pursuing the heavy water option in hopes of eventually building a heavy water reactor to produce plutonium for nuclear weapons.[585]

The IAEA Director General Mohammed El-Baradei visited Natanz in February 2003 and El-Baradei found that Iran had indeed committed safeguards violations. The findings from the visit showed 1) Iran had acquired natural uranium in 1991 that had gone unreported; 2) the Kalaye Electric Company workshop had been used to produce centrifuge components; and 3) there remained a number of additional questions regarding Iran's centrifuge program, laser program, and heavy water program.[586] Also, Iran had not

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[582] Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, July–December 2002," https://www.cia.gov/library/reports/archived-reports-1/jul_dec2002.pdf.

[583] Director of Central Intelligence; Shreeya Sinha and Susan Campbell Beachy, "Timeline on Iran's Nuclear Program," *New York Times*, March 21, 2013, http://www.nytimes.com/interactive/2014/11/20/world/middleeast/Iran-nuclear-timeline.html.

[584] Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, July–December 2002."

[585] Ibid.

[586] International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran," June 6, 2003, 2–3, https://www.iaea.org/sites/default/files/gov2003-40.pdf.

been cooperative in allowing the IAEA to inspect the Kalaye Electric Company workshop.[587]

Additional information regarding Iran's program surfaced. Cirincione, Wolfsthal, and Rajkumar describe it in *Deadly Arsenals*. Environmental samples taken from Natanz in early 2003 before the facility was to officially become operational revealed highly enriched uranium particles.[588] Iran denied that uranium had already entered the facility and claimed that the presence of highly enriched uranium was due to contaminated centrifuge parts obtained from Pakistan.[589] Iran did concede, however, that "a small number of gas centrifuges were tested with uranium gas at the [Kalaye Electric Company] site between 1998 and 2002," while claiming that the enrichment had not exceeded 1.2 percent uranium-235.[590] Iran also admitted that it created "a small amount of plutonium outside of safeguards" and that it occurred "at the U.S.-supplied TRR between 1988 and 1998 when Iran irradiated depleted uranium dioxide (UO_2) targets using materials previously exempted from safeguards in 1978 and later declared lost as waste."[591]

In June 2003, Iran began testing at the pilot plant at Natanz with uranium hexafluoride. By late 2003, Iran had nearly put into place a 164-machine cascade, according to Cirincione, Wolfsthal, and Rajkumar.[592] In addition, the IAEA later received reports that Iran was working on a "green salt" project, a uranium conversion method, in addition to "high explosives (including the development of exploding bridgewire detonators); and re-engineering of the payload chamber of the Shahab 3 missile re-entry vehicle" during 2002 and 2003.[593]

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587 Ibid., 3.

588 Cirincione, Wolfsthal, and Rajkumar, *Deadly Arsenals*, 300.

589 Ibid.

590 Ibid., 301.

591 Ibid.

592 Ibid., 300.

593 International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement and Relevant Provisions of Security Council Resolutions in the Islamic Republic of Iran," November 8, 2011, Annex, 5, https://www.iaea.org/sites/default/files/gov2011-65.pdf.

U.S. intelligence noted its own concern in 2003 that Iran seemed to be pursuing both the highly enriched uranium and plutonium paths to nuclear weapons acquisition.[594] U.S. intelligence expressed particular concern regarding the uranium centrifuges found at Natanz and Iran's efforts to acquire a heavy water research reactor.[595]

The IAEA and the U.S. intelligence community reported that Iran halted the country's coordinated military nuclear program toward the end of 2003. The IAEA noted that "before the end of 2003, an organizational structure was in place in Iran suitable for the coordination of a range of activities relevant to the development of a nuclear explosive device. Although some activities took place after 2003, they were not a part of a coordinated effort."[596] The U.S. intelligence community assessed that "Iranian military entities were working under government direction to develop nuclear weapons until fall 2003."[597] Nuclear weapons-related development occurred after 2003, but both the IAEA and U.S. intelligence made clear that Iran halted this coordinated military approach toward the end of 2003.[598] Further, the U.S. intelligence community judged with "high confidence" that this was due to "increasing international scrutiny and pressure resulting from exposure of Iran's previously undeclared nuclear work."[599]

After the revelations regarding Natanz, the United Kingdom, France, and Germany joined together to persuade Iran to end its suspect nuclear activities. During an

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[594] Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, January–June 2003," https://www.cia.gov/library/reports/archived-reports-1/jan_jun2003.pdf.

[595] Ibid.

[596] International Atomic Energy Agency, Board of Governors, Director General, "Final Assessment on Past and Present Outstanding Issues Regarding Iran's Nuclear Program," December 2, 2015, Section E.1. Paragraph 24., https://www.iaea.org/sites/default/files/gov-2015-68.pdf.

[597] Director of National Intelligence, "Annual Threat Assessment of the Intelligence Community for the Senate Select Committee on Intelligence, 2009," February 12, 2009, 19, https://www.dni.gov/files/documents/Newsroom/Testimonies/20090212_testimony.pdf.

[598] International Atomic Energy Agency, Board of Governors, Director General, "Final Assessment on Past and Present Outstanding Issues Regarding Iran's Nuclear Program," Section E.1. Paragraph 24.; Director of National Intelligence, "Annual Threat Assessment of the Intelligence Community for the Senate Select Committee on Intelligence, 2009," 19.

[599] Director of National Intelligence, "Annual Threat Assessment of the Intelligence Community for the House Permanent Select Committee on Intelligence, 2008," February 7, 2008, 12, https://www.dni.gov/files/documents/Newsroom/Testimonies/20080207_testimony.pdf.

October 2003 joint visit by each country's foreign minister to Iran, they requested that Iran: 1) "suspend uranium enrichment," 2) "detail the full scope of its nuclear program and facilities," and 3) "sign the Nuclear Non-Proliferation Treaty Additional Protocol."[600] During the visit, Iran agreed to these requirements. By December 2003, Iran had completed all three actions, although it only signed but did not ratify the Additional Protocol. This agreement helped mitigate the outcry over the IAEA's November 2003 report on Iran that described the extensive safeguard breaches discovered over the course of the year.[601]

In terms of Iran's delivery systems, U.S. intelligence assessed that North Korea, China, and Russia provided Iran with ballistic missile technology and equipment during this period.[602] In 1992, Director of Central Intelligence Robert Gates noted in testimony to the U.S. Congress that following the Iran-Iraq War, Iran looked to North Korea for Scuds and to China for cruise and ballistic missiles.[603] In addition, according to Garver, throughout the 1990s, missile experts from China and North Korea worked alongside Iran to help develop the country's missile program, particularly the Shahab-3.[604]

A 1997 U.S. intelligence report noted that Iran's goal was to be "self-sufficient in the production of medium-range ballistic missiles" as Iran was already able to manufacture short-range Scud missiles with the assistance of North Korea.[605] U.S. intelligence reported that Iran conducted a Shahab-3 medium-range ballistic missile flight

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600 Walter Posch, Garrett Nada, and Cameron Glenn, "The Iran Primer: Iran and the European Union" (Washington, DC: U.S. Institute of Peace, February 2016), http://iranprimer.usip.org/resource/iran-and-european-union.

601 International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran," November 10, 2003, https://www.iaea.org/sites/default/files/gov2003-75.pdf.

602 Director of Central Intelligence, "Report of Proliferation-Related Acquisition in 1997."

603 *The Role of the Intelligence Community in the Post-Cold War Era*, Hearings Before the Committee on Foreign Affairs, House of Representatives, 102nd Congress, 206 (1992) (testimony of the Director of Central Intelligence), http://www.loc.gov/law/find/nominations/gates/009_excerpt.pdf.

604 Garver, *China and Iran*, 188–89.

605 Director of Central Intelligence, "Report of Proliferation-Related Acquisition in 1997"; Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, January–June 1998."

test in July 1998 and was already producing them.[606] In mid-1999, U.S. intelligence assessed that Iran's Shahab-3 missile had "emergency operational capability," meaning that a limited number could be deployed and used if needed.[607] In addition, U.S. intelligence noted in 1998, Iran "acknowledged the development of the Shahab-4, originally calling it a more capable ballistic missile than the Shahab-3, but later categorizing it as solely a space launch vehicle with no military applications."[608] Finally, as of mid-1999, plans for a Shahab-5, a possible intermediate-range ballistic missile, had also been discussed, according to U.S. intelligence.[609]

In 2002, the United States placed sanctions on five Chinese companies for their role in helping Iran build the Shahab-3.[610] North Korea had initially provided Iran with ballistic missiles during the Iran-Iraq War, but ballistic missile exports and technical cooperation continued throughout the 1990s, according to Paul Kerr, Steven Hildreth, and Mary Beth Nikitin.[611] The United States imposed sanctions on North Korea in 1996 for transferring missile technology to Iran.[612]

Also, from the mid-1990s, Iran and Russia worked closely together on Iran's ballistic missile development. The U.S. intelligence community testified to Congress in 2000 that "assistance by Russian entities has helped Iran save years in its development of the Shahab-3" and "Russian assistance also is playing a crucial role in Iran's ability to

606 Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, January–June 1998."

607 Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, January–June 1999."

608 Ibid.

609 Ibid.

610 Garver, *China and Iran*, 189.

611 Kerr, Hildreth, and Nikitin, "Iran-North Korea-Syria Ballistic Missile and Nuclear Cooperation," 4.

612 Cirincione, Wolfsthal, and Rajkumar, *Deadly Arsenals*, 306.

develop more sophisticated and longer-range missiles."[613] Consequently, the United States placed trade restrictions on a handful of Russian aerospace companies.[614]

Russia began to be more cautious about sharing its missile technology with Iran after the Indian and Pakistani nuclear tests in 1998.[615] Parker noted that in an interview with former Russian Security Council official Vladimir Lebedev in 2000, Lebedev claimed that Russia did complain to Iran that "the Shahab-3 posed a security threat to Russia," but that the Iranians "continued to steal Russian know-how and materials" and Moscow "continued to catch and punish them."[616]

As a result of Iran's efforts and the assistance from various suppliers, as of late 2000, Iran had one of the biggest ballistic missile programs in the Middle East, according to U.S. intelligence.[617] Furthermore, the intelligence community reported that the missiles could reach Iraq and other Persian Gulf countries and Iran was working to deploy the 1,300 km-range Shahab-3 medium-range ballistic missile allowing it to reach Israel, Saudi Arabia, and Turkey.[618] U.S. intelligence assessed that as of mid-2003, its missile inventory included some medium-range ballistic missiles and several hundred short-range ballistic missiles, to include the solid-propellant Fateh-110.[619]

Finally, the IAEA reported that work was allegedly done from 2002 to 2003 as Project 111 and involved studies "to examine how to integrate a new spherical payload

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613 *Russian Proliferation to Iran's Weapons of Mass Destruction and Missile Programs*, Hearings Before the Senate Committee on Foreign Relations, Senate, 106th Congress, (October 5, 2000) (testimony of John A. Lauder, Director, Director of Central Intelligence Nonproliferation Center, https://www.cia.gov/news-information/speeches-testimony/2000/lauder_WMD_100500.html.

614 Ibid.

615 Parker, *Persian Dreams*, 126.

616 Ibid., 126–27.

617 Lauder, testimony on *Russian Proliferation to Iran's Weapons of Mass Destruction and Missile Programs*.

618 Ibid.

619 Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, January–June 2003."

into the existing payload chamber which would be mounted in the re-entry vehicle of the Shahab-3 missile."[620]

c. Nuclear Trends

Until late 2003, Iran steadily increased its nuclear capabilities and seemed to be doing so with the aim of acquiring nuclear weapons. There was a persistent drive for nuclear capabilities until the early 2000s. Iran worked with state and non-state actors in both an overt and covert fashion to build its nuclear program. Iran only slowed its overall nuclear efforts in 2003 upon the discovery of the Natanz facility. It was also in this timeframe that a U.S.-led coalition invaded Iraq.

What drove Iran's nuclear behavior? In the regional context, Iran continued to face the possibility of existential threats, particularly from Iraq. Iran may have also perceived an opportunity to achieve regional hegemony, particularly as Iraq became even weaker in the late 1990s and early 2000s. Iran continued to confront Israel through low-intensity conflict rather than a direct military challenge. Nevertheless, it was not apparent that a possible threat from Israel drove Iran's nuclear activities. Ray Takeyh asserted that "however disturbing the Zionist threat may be to Iranian clerics, it does not drive Tehran's pursuit of nuclear weapons."[621] From the information examined here, it was clear, however, that the United States was aware throughout this period that Iran was pursuing nuclear weapons and the superpower sought to constrain Iran's acquisition efforts. The unraveling of the A.Q. Khan network in the early 2000s and the exposure of the Natanz facilities likely were most damaging to Iran's efforts. The country appeared to halt its coordinated military nuclear program in 2003.

3. Iraq

The First Gulf War marked the beginning of a major regional power shift. The United States forced Iraq out of Kuwait. The subsequent findings regarding Iraq's nuclear

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620 International Atomic Energy Agency, Director General, "Implementation of the NPT Safeguards Agreement and Relevant Provisions of Security Council Resolutions in the Islamic Republic of Iran," November 8, 2011, 11.

621 Takeyh, "Iran at the Strategic Crossroads," 53–54.

weapons program began more than a decade long effort to halt Iraq's nuclear endeavors and culminated in the Second Gulf War. During the 1990s, Iraq became weaker militarily and economically. By the end of the time period, a regional political shift had begun to occur whereby Iraq had receded politically and Iran had become more dominant.

a. Political Context

As in Iran, Iraq's economy was in shambles following the Iran-Iraq War. Iraq looked for ways to improve its financial situation. It sought debt relief from its Gulf neighbors, Kuwait and Saudi Arabia in particular, and a reduction of or adherence to Organization of Petroleum Exporting Countries production quotas to boost oil prices, in hopes that rising prices would also lift Iraq's economy.[622] Iraq became upset with Kuwait when it did not agree to forgive Iraq's debts, maintained or exceeded its production quotas, and started slant drilling into the Iraqi side of the Rumaila oil field, which the two countries shared.[623] Iraq also claimed that Kuwait historically had been a part of Iraq. Iraq decided to deal with these issues by invading Kuwait on August 2, 1990. In response, the United Nations (UN) Security Council passed resolution 661 on August 6, 1990, imposing sanctions on Iraq for the invasion.

Iraq's actions caused a shift in regional alliances. Within the Arab League, countries that opposed Iraq's invasion included Egypt, Lebanon, Syria, Saudi Arabia, Bahrain, Qatar, Oman, and the United Arab Emirates.[624] Prior to the invasion, Iraq had maintained good relations with both Egypt and Saudi Arabia. Jordan and the Palestine Liberation Organization were sympathetic to Iraq's position.[625] Yemen, Sudan, and

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622 Liam Anderson and Gareth Stansfield, *The Future of Iraq: Dictatorship, Democracy, or Division?*, Revised edition (New York: St. Martin's Griffin, 2005), 84–85.

623 Ibid., 85.

624 John Kifner, "Confrontation in the Gulf; Badly Divided Arab League Votes To Return Headquarters to Cairo," *New York Times*, September 11, 1990, http://www.nytimes.com/1990/09/11/world/confrontation-gulf-badly-divided-arab-league-votes-return-headquarters-cairo.html.

625 Ibid.

Libya opposed the use of Saudi territory by U.S. forces to launch an operation against Iraq.[626]

The Persian Gulf states, especially Saudi Arabia, were eager to have Iraq removed from Kuwait. As Sean Foley wrote, "the United States and its allies had the resources to evict Iraq from Kuwait, and Saudi Arabia and the other GCC states did everything to make that possible."[627] These efforts included housing soldiers and allowing the United States and other coalition members to use Saudi airfields and the largest Emirati port.[628]

The First Gulf War began on January 17, 1991. After the beginning of this war, Iraq launched Scud missiles against Saudi Arabia and Israel. The U.S.-led coalition worked quickly and, despite Iraq possessing the world's fourth-largest army, the war was over in a matter of weeks. The United States declared an end to hostilities on February 28.

While Iraq suffered a crushing defeat, the conflict left the Iraqi military relatively intact. After the war, Saddam Hussein faced popular uprisings by the Kurds in the north and the Shia in the south. These groups perceived that they were supported by the United States.[629] He then turned what was left of the Iraqi military against these two populations in order to regain control of the country. In response to these attacks, the United States, the United Kingdom, and France imposed a no-fly zone above the 36th parallel to protect the Kurds and below the 32nd parallel to protect the Shia.

The international community continued to monitor Iraq following the war. The UN Security Council passed resolution 687 in April 1991 that mandated Iraq relinquish all weapons of mass destruction and established the UN Special Commission on Iraq to

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626 Ibid.

627 Sean Foley, *The Arab Gulf States: Beyond Oil and Islam* (Boulder, CO: Lynne Rienner Publishers, 2010), 97.

628 Ibid.

629 Anderson and Stansfield, *The Future of Iraq*, 88.

monitor the dismantlement of Iraq's program.[630] Also, resolution 661 was kept in place in order to use the economic sanctions to encourage Iraqi cooperation in regard to resolution 687. Efforts to pressure Iraq to fully comply with resolution 687 continued until the beginning of the Second Gulf War in 2003.

Iraq's regional relations deteriorated significantly with its invasion of Kuwait: Bahrain, Egypt, Kuwait, Oman, Qatar, Saudi Arabia, Syria, Turkey, and the United Arab Emirates sided with the U.S.-led coalition.[631] Jordan was the only Arab state to remain friendly with Iraq. Further, Iran and Israel already had poor relations with Iraq. Iraq was nearly completely isolated. A possible competitor for regional hegemony had been destroyed largely to the benefit of Iran and the Gulf States, especially Saudi Arabia. What the region gained was the increased regional presence of the sole superpower. As Liam Anderson and Gareth Stansfield noted, "a devastating military defeat by coalition forces in 1991 and over 12 years of stringent economic sanctions imposed by the United Nations destroyed the state of Iraq from the inside out. By March 2003, when Saddam once again defiantly confronted a massively superior coalition of the willing, he was presiding over a failed state."[632]

b. Nuclear Program

Nearly all of Iraq's important nuclear facilities were bombed during the First Gulf War. The Duelfer Report noted that this included the buildings at Al-Tuwaitha, the electromagnetic isotope separator enrichment plants at Al-Tarmiya and Al-Sharqat, the yellowcake recovery plant at Al-Qa'im, and the feed material plant at Mosul.[633] The site Iraq had chosen for nuclear weapons development, Al-Atheer, was damaged during the

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630 Ruth Wedgwood, "The Enforcement of Security Council Resolution 687: The Threat of Force against Iraq's Weapons of Mass Destruction," *American Journal of International Law* 92, no. 4 (1998): 724, https://doi.org/10.2307/2998137.

631 "Gulf War Fast Facts," *CNN News*, accessed June 21, 2016, http://www.cnn.com/2013/09/15/world/meast/gulf-war-fast-facts/index.html.

632 Anderson and Stansfield, *The Future of Iraq*.

633 Iraq Survey Group, "Comprehensive Report of the Special Advisor to the DCI on Iraq's WMD [The Duelfer Report, Volume II of III; 'Nuclear'; Includes Annexes; Part 2 of 2]," 4.

bombing, according to the International Institute for Strategic Studies.[634] Nevertheless, the sites for centrifuge research and production at Al-Rashdiya and Al-Furat, respectively, were not found or bombed.[635]

Following the war, what remained of Iraq's program was dismantled. UN Security Council resolution 687, passed in April 1991, gave the IAEA the mandate to dismantle Iraq's nuclear weapons program. The UN Special Commission on Iraq handled this task. In addition, resolution 707 banned "nuclear activities of any kind, except for use of isotopes for medical, agricultural or industrial purposes" until Iraq fully complied with resolutions 687, paragraphs 12 and 13, and 707.[636] Garry Dillon, an IAEA official who worked on this issue in Iraq, noted that thirty inspection campaigns by the IAEA occurred between May 1991 and October 1997 during which the IAEA oversaw the destruction and disablement of nuclear facilities and removed all weapons-usable nuclear material from Iraq.[637] Al-Tuwaitha and Al-Qa'Qaa, the latter a facility for producing explosives, were monitored by the IAEA until 1998 and inspectors dismantled any nuclear-related items.[638] The Al-Atheer nuclear complex was where most of Iraq's nuclear weapons work occurred and, by 1998, the IAEA had destroyed the main buildings at Al-Atheer and eliminated the nuclear-related equipment placed there.[639]

The extent of Iraq's progress alarmed the international community. In 1997, IAEA Director General Hans Blix noted the impact of the 1991 Iraq War and the discoveries about Iraq's nuclear program that followed. He stated that "the 'shock' of Iraq as a result of its clandestine enrichment program and its advanced work on

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634 International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran*, 89.

635 Iraq Survey Group, "Comprehensive Report of the Special Advisor to the DCI on Iraq's WMD [The Duelfer Report, Volume II of III; 'Nuclear'; Includes Annexes; Part 2 of 2]," 4.

636 United Nations Security Council, "Resolution 707 (1991)" (New York: United Nations Security Council, August 15, 1991), 4, http://www.un.org/Depts/unmovic/documents/707.pdf.

637 Gary B. Dillon, "The IAEA in Iraq: Past Activities and Findings," *IAEA Bulletin* 44, no. 2 (2002): 13.

638 International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran*, 91.

639 Ibid., 90.

weaponization prompted broad recognition of the limitations of the safeguards system, which at that time, was geared to declared sites."[640] Further, since the "shock" of Iraq, he noted there had been a "sea change in IAEA safeguards."[641] He cited "the agency's use of environmental sampling in about forty places in Iraq as a key means to provide enhanced assurance about its nuclear activities."[642]

Iraq was not fully cooperative with dismantlement efforts. Directly after the 1991 war, Iraq sought to hide its clandestine program from inspectors. Upon the seizure of electromagnetic isotope separator components in mid-1991 and nuclear documents in September 1991, Iraqi officials became more forthcoming regarding the program.[643] The IAEA acquired another treasure trove of documents in August 1995 when Saddam Hussein's son-in-law, Hussein Kamel, who had played an important role in Iraq's nuclear program, defected.[644] Kamel provided the IAEA with more documents on Iraq's centrifuge and nuclear programs.[645]

By the mid-1990s, Hussein began to look for ways to rebuild Iraq's nuclear program. Iraq's Oil for Food Program, created in 1995, allowed Iraq to exchange its oil for food and basic necessities for the Iraqi population who were suffering under the economic sanctions imposed in conjunction with the First Gulf War. Once money became available as a result of the program, Iraq began to fund projects that had some applicability to nuclear weapons research, according to the Duelfer Report.[646] In addition, Iraq's ministers were ordered to safeguard the country's technical

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640 U.S. Department of State, "June 26–27 Visit to Washington, DC by IAEA Director General Hans Blix," 1997, 7, 1679158523; KO01324, Digital National Security Archive, http://libproxy.nps.edu/login?url=http://search.proquest.com/docview/1679158523?accountid=12702.

641 Ibid., 4.

642 Ibid.

643 Iraq Survey Group, "Comprehensive Report of the Special Advisor to the DCI on Iraq's WMD [The Duelfer Report, Volume II of III; 'Nuclear'; Includes Annexes; Part 2 of 2]," 5.

644 International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran*, 90.

645 Iraq Survey Group, "Comprehensive Report of the Special Advisor to the DCI on Iraq's WMD [The Duelfer Report, Volume II of III; 'Nuclear'; Includes Annexes; Part 2 of 2]," 5.

646 Ibid., 6.

capabilities.[647] This included expanding technical research and improving the welfare of Iraq's nuclear experts.[648] In fact, the Duelfer Report found that Hussein indicated that once sanctions ended, Iraq would continue developing its nuclear program to reestablish the regional "strategic balance."[649]

Despite Iraq's efforts to maintain or rebuild aspects of its nuclear program, the country met with little success. In its reports to Congress in 1996 and 1997, U.S. intelligence found that Iraq had acquired some dual-use equipment, but no equipment that was directly related to weapons of mass destruction.[650] In 1997, Blix reported to the UN Security Council that Iraq had not been able to produce a nuclear weapon nor did it even have the capability to produce nuclear material for such a weapon.[651] According to Dillon, for its part, as of late 1998 when the UN and the IAEA lost access to Iraq, the IAEA

> was satisfied that there were no indications of Iraq having: produced a nuclear weapon; produced more than a few grams of weapon-usable nuclear material (HEU or separated plutonium) through its indigenous processes; otherwise acquired weapons-usable nuclear material; or retained any physical capability for the production of amounts of weapons-usable nuclear material of any practical significance.[652]

In addition, all of the reactor fuel that Iraq might have used for its "crash program," had been removed by the IAEA from Iraq.[653]

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[647] International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran*, 91.

[648] Ibid.

[649] Iraq Survey Group, "Comprehensive Report of the Special Advisor to the DCI on Iraq's WMD [The Duelfer Report, Volume I of III; 'Transmittal Message' and 'Regime Strategic Intent'; Includes Charts, Photographs, Tables and Illustrations; Part 1 of 3]," 31.

[650] Director of Central Intelligence, "The Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions: July–December 1996"; Director of Central Intelligence, "Report of Proliferation-Related Acquisition in 1997."

[651] International Atomic Energy Agency, Director General, "Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under Paragraph 16 of Security Council Resolution 1051 (1996)" (New York: United Nations Security Council, October 8, 1997), 21, https://www.iaea.org/OurWork/SV/Invo/reports/s_1997_779.pdf.

[652] Dillon, "The IAEA in Iraq: Past Activities and Findings," 14.

[653] Ibid.

While taking covert steps to reconstitute its nuclear program, Iraq sought to improve its relationship with the United States in the mid- to late 1990s. Charles Duelfer shared that "between 1994 and 1998, both he and UNSCOM Executive Chairman Rolf Ekeus were approached multiple times by senior Iraqis with the message that Baghdad wanted a dialogue with the United States, and that Iraq was in a position to be Washington's 'best friend in the region bar none.'"[654] Hussein himself stated in a custodial debriefing that "he wanted to develop better relations with the U.S. over the latter part of the 1990s," but that "he was not given a chance because the U.S. refused to listen to anything Iraq had to say," according to the Duelfer Report.[655]

By late 1998, Iraq had become very uncooperative with IAEA inspectors. Iraq did not allow UN inspections after Operation Desert Fox in December and took down the UN's video monitoring system.[656] UN Security Council resolution 1284, established in December 1999, set up the United Nations Monitoring, Verification, and Inspection Committee to monitor Iraq's possible WMD efforts, but Iraq continued to refuse to allow the UN to conduct inspections.[657] The IAEA had created an Iraq Action Team in 1997 to pursue inspections, but it was not permitted to carry out inspections either.[658] Thus, from 1999 through 2002, neither the UN nor the IAEA had access to Iraq to conduct inspections and, thus, were handicapped in their analysis of Iraq's nuclear program.

U.S. intelligence continued to report to Congress regarding its assessment of the situation in Iraq. As of 2000, the U.S. intelligence community assessed that Iraq

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654 Iraq Survey Group, "Comprehensive Report of the Special Advisor to the DCI on Iraq's WMD [The Duelfer Report, Volume I of III; 'Transmittal Message' and 'Regime Strategic Intent'; Includes Charts, Photographs, Tables and Illustrations; Part 1 of 3]," 31.

655 Ibid.

656 Executive Chairman of the United Nations Special Commission on Iraq, "Semi-Annual Report to Security Council: Seventh Report Under Resolution 1051" (New York: United Nations Security Council, April 9, 1999), http://www.un.org/Depts/unscom/sres401eng.htm; Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, January–June 1999."

657 United Nations Security Council, "Resolution 1284 (1999)" (New York: United Nations Security Council, December 17, 1999), http://www.un.org/Depts/unmovic/new/documents/resolutions/s-res-1284.pdf.

658 Dillon, "The IAEA in Iraq: Past Activities and Findings," 16.

"probably continued low-level theoretical R&D associated with its nuclear program," but acquiring "a sufficient source of fissile material" remained a challenge.[659] Concerns were further raised in September 2000 when Saddam Hussein "publicly exhorted his 'Nuclear Mujahidin' to 'defeat the enemy.'"[660] In the early 2000s, before the 2003 U.S.-led invasion of Iraq, U.S. intelligence provided Congress with its assessment regarding Iraq's capabilities. It noted the following:

- Saddam Hussein still wished to obtain nuclear weapons.[661]
- Iraq's efforts to acquire "high-strength aluminum tubes" were of concern.[662]
- Some analysts believed that the aluminum tubes were for Iraq's nuclear program and some believed they were for conventional weapons.[663]
- A majority of analysts believed that Iraq sought to rebuild its nuclear program.[664]
- In order to rebuild its nuclear program, Iraq retained its "nuclear scientists and technicians, its program documentation, and sufficient dual-use

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659 Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, January–June 2000," accessed March 7, 2016, https://www.cia.gov/library/reports/archived-reports-1/jan_jun2000.htm.

660 Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, July–December 2000."

661 Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, January–June 2001," https://www.cia.gov/library/reports/archived-reports-1/jan_jun2001.htm.

662 Ibid.

663 Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, January–June 2002."

664 Ibid.

manufacturing capabilities to support a reconstituted nuclear weapons program."[665]

- Iraq's greatest challenge in its pursuit of a nuclear weapon would be obtaining fissile material. And Iraq would not "produce indigenously enough weapons-grade material for a deliverable nuclear device until the last half of this decade."[666]

In late 2002, Iraq allowed the UN and IAEA inspectors back inside the country, but it was too little too late for U.S. policymakers. While the inspectors quickly returned to work collecting information regarding Iraq's nuclear activities, Washington was convinced that Iraq's nuclear program posed a significant threat. The United States led a coalition that invaded Iraq again on March 20, 2003.

Due to the political firestorm in the United States regarding the rationale for the invasion of Iraq, the Duelfer Report was commissioned. This report, which was published in 2004, found that, in terms of actual nuclear capability, Hussein aspired to have a nuclear program, but Iraq's nuclear capability had been destroyed during and after the 1991 war. The report "uncovered no indication that Iraq had resumed fissile material or nuclear weapon research and development activities since 1991."[667] It was clear that Hussein wished to reconstitute the country's nuclear program and to signal to the region and the world that he was doing so. It was less clear how capable he was of accomplishing the former goal given how much of the country's nuclear infrastructure had been dismantled in the 1991 to 1998 timeframe. The 1991 Gulf War and the ensuing inspections regime accomplished what the 1981 bombing of the Osirak reactor did not achieve—the end of Iraq's nuclear program.

In further damage to Iraq's nuclear program, after the U.S.-led military action, looting of Iraq's nuclear facilities occurred in early 2003. This included the possible loss

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[665] Ibid.

[666] Ibid.

[667] Iraq Survey Group, "Comprehensive Report of the Special Advisor to the DCI on Iraq's WMD [The Duelfer Report, Volume II of III; 'Nuclear'; Includes Annexes; Part 2 of 2]," 6.

of 10 kg of uranium compounds.[668] Also, a large number of its nuclear scientists fled the country or were killed.[669]

Regarding delivery systems, Iraq worked to expand its ballistic missile capability even after the First Gulf War. During the war, Iraq launched 90 Scud missiles at Israel, Saudi Arabia, and U.S.-led coalition forces.[670] And Iraq continued ballistic missile development after the war.[671] According to the Duelfer Report, Iraq was primarily concerned about Iran's capabilities as it developed its missile program. The report noted that captured documents revealed that Iraq's National Security Committee advised in 2001 that "Iran would remain Iraq's foremost enemy and that the Iranians would rely heavily on missiles in a future war."[672] The Duelfer Report also judged that the aluminum tubes that helped provide a rational for invading Iraq in 2003 were linked to Iraq's missile program (not its centrifuge program). The report noted that "Baghdad's interest in high-strength, high-specification aluminum tubes . . . is best explained by its efforts to produce 81-mm rockets" and Iraq did not seem to be interested in them for a nuclear end use.[673]

As part of its missile program, Iraq worked to develop both liquid-propellant and solid-propellant missiles with an extended range despite monitoring and sanctions. The UN Monitoring, Verification, and Inspection Committee reported that by late 1998, Iraq was developing the Al-Nidaa missile with a range of 70 km, the Al-Ubour missile with a range of 70–80 km, the Ababil-100 / Al-Fatah missile with a range of 144 km, and the

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668 International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran*, 92.

669 Ibid.

670 Said, "Missile Proliferation in the Middle East: A Regional Perspective," 49; "Profile for Iraq—Missile."

671 Cirincione, Wolfsthal, and Rajkumar, *Deadly Arsenals*, 330.

672 Iraq Survey Group, "Comprehensive Report of the Special Advisor to the DCI on Iraq's WMD [The Duelfer Report, Volume I of III; 'Transmittal Message' and 'Regime Strategic Intent'; Includes Charts, Photographs, Tables and Illustrations; Part 1 of 3]," 30.

673 Iraq Survey Group, "Comprehensive Report of the Special Advisor to the DCI on Iraq's WMD [The Duelfer Report, Volume II of III; 'Nuclear'; Includes Annexes; Part 2 of 2]," 21.

Al-Raad missile, which was like a Frog missile.[674] U.S. intelligence indicated that Iraq was developing the Al Samoud liquid-propellant missile with a range of less than 150 km.[675] Through the late 1990s, U.S. intelligence remained concerned that the technology for these short-range missiles could also be used for missiles with a longer reach once Iraq was under less scrutiny or no longer under sanctions.[676] U.S. intelligence noted with suspicion in 1999 that the "personnel previously involved with the Condor II/Badr-2000 missile—which was largely destroyed during the Gulf War and eliminated by UNSCOM—are working on the Ababil-100 program."[677]

After Operation Desert Fox in 1998 and Iraq's subsequent termination of UN and IAEA inspections, U.S. intelligence reported that Iraq began to rebuild several facilities for missile production.[678] In late 2001, U.S. intelligence expressed concern regarding two new buildings at the Al-Mamoun plant for mixing solid-propellant, originally intended to be the construction site for the Badr-2000 or Condor solid-propellant missiles.[679] U.S. intelligence believed that the best explanation for the size of these buildings and the way they were constructed was to produce longer-range missiles, especially because of the

674 United Nations Monitoring, Verification, and Inspection Commission, "The Development of Iraq's Missile Capabilities" (United Nations, November 26, 2003), 15, http://www.un.org/Depts/unmovic/new/documents/quarterly_reports/s-2003-1135.pdf.

675 Director of Central Intelligence, "Report of Proliferation-Related Acquisition in 1997."

676 Ibid.; Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, July-Dec 1999."

677 Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, January–June 1999."

678 Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, January–June 2000."

679 Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, July–December 2001."

reconstruction of casting pits.[680] As of 2003, however, the UN Monitoring, Verification, and Inspection Committee had destroyed the casting pits.[681]

By the early 2000s, Iraq appeared to be extending the range of its missiles. U.S. intelligence noted that four Al-Samoud transporter-erector-launchers with airframes and two Ababil-100 transporter-erector-launchers and airframes made an appearance at a parade in Iraq in late December 2000.[682] The UN Monitoring, Verification, and Inspection Committee reported that Iraq had begun producing the Al-Samoud 2 in 2002.[683] By June 2002, the U.S. intelligence community had assessed that the Al-Samoud 2, the successor of the Al-Samoud missile, and the Ababil-100 had both gone beyond the range of 150 km permitted by the UN.[684] As of late 2002, U.S. intelligence had information that Iraq may have "pursued a longer-range liquid-propellant missile capable of flying beyond 1,200 km."[685] In February 2003, the UN Monitoring, Verification, and Inspection Committee declared the Al-Samoud 2 prohibited due to an operational range in excess of 150 km and supervised its destruction.[686] The Committee still lacked the necessary information for it to make the determination whether the Ababil-100 operated within the allowed 150 km range.[687] In sum, Iraq moved forward as aggressively as it could under sanctions to expand its ballistic missile capabilities.

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680 Ibid.

681 UN Monitoring, Verification, and Inspection Commission, "The Development of Iraq's Missile Capabilities," 16.

682 Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, July–December 2000."

683 UN Monitoring, Verification, and Inspection Commission, "The Development of Iraq's Missile Capabilities," 14.

684 Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, January–June 2002."

685 Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, July–December 2002."

686 UN Monitoring, Verification, and Inspection Commission, "The Development of Iraq's Missile Capabilities," 14.

687 Ibid., 15.

c. Nuclear Trends

During this period, two shifts occurred in Iraq's nuclear program. First, Iraq lost most of its nuclear infrastructure as a result of the First Gulf War. This war and the inspections regime that followed essentially ended the program. Then, even as IAEA and UN inspections continued, Hussein sought to move Iraq's nuclear program forward beginning in 1995. After the implementation of the "Oil for Food" program, Hussein sought to redirect money toward nuclear research.[688] The latter shift demonstrated a lingering intent that did not translate into an improved nuclear capability as the United States led an effort to block Iraq's every attempt to move its nuclear program forward.

What drove Iraq's behavior? The investigations following the 2003 Gulf War made it clear that Hussein tried to play a game of hedging with the international community from 1991 through 2003. Iraq's nuclear weapons capability was at its peak just before the 1991 Gulf War and declined throughout the period. In the face of this decline, Hussein sought to convince the world that Iraq had a greater nuclear capability than it did. Hussein strongly believed in the power of nuclear weapons and the power of the idea of nuclear weapons. He seemed to think that even the perception of a nuclear capability without the actual capability was much better than acknowledging the lack thereof. The Duelfer Report summarized the rationale for this hedging:

> The Iran-Iraq War and the ongoing suppression of internal unrest taught Saddam the importance of WMD to the dominance and survival of the Regime. Following the destruction of much of the Iraqi WMD infrastructure during Desert Storm, however, the threats to the Regime remained; especially his perception of the overarching danger from Iran. In order to counter these threats, Saddam continued with his public posture of retaining the WMD capability.[689]

Looking at Iraq's activities in a regional context, the Duelfer Report made clear that Iraq continued to be preoccupied with the threat from Iran even until the Second Gulf

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[688] Iraq Survey Group, "Comprehensive Report of the Special Advisor to the DCI on Iraq's WMD [The Duelfer Report, Volume II of III; 'Nuclear'; Includes Annexes; Part 2 of 2]," 6.

[689] Iraq Survey Group, "Comprehensive Report of the Special Advisor to the DCI on Iraq's WMD [The Duelfer Report, Volume I of III; 'Transmittal Message' and 'Regime Strategic Intent'; Includes Charts, Photographs, Tables and Illustrations; Part 1 of 3]," 34.

War in 2003. According to the report, Hussein's former Vice President Taha Yassin Ramadan stated that "Saddam judged Israel to be a lesser adversary than Iran because Israel could not invade Iraq."[690] Iraq's hedging occurred as it was being stripped of its nuclear capabilities, which likely left it feeling vulnerable to its greatest security threat, Iran.

While Iraq surely realized that the United States posed the most significant potential threat throughout the period, according to the Duelfer Report, Hussein believed it unlikely the superpower would invade Iraq.[691] Furthermore, the Iraqi regime sought to improve the relationship with the United States as evidenced by the outreach to the Iraq Survey Group and UN Special Commission on Iraq leadership between 1994 and 1998. It seemed to be an effort by Hussein to re-establish Iraq as a regional hegemon. Nevertheless, it was the efforts of the United States over this period that resulted in the elimination of Iraq's nuclear capabilities.

4. Libya

In the early 1990s, Libya faced pressure to move away from its past state-sponsorship of terrorism. U.S. and UN sanctions weakened the country's economy and further isolated the regime. In addition, throughout the 1990s, Libya sought to expand its nuclear program, especially through collaboration with the A.Q. Khan network. This continued until early 2003 when Libya began negotiations with the United States and the United Kingdom for an end to Libya's nuclear program.

a. Political Context

While Libya had sought to mend relations with its neighbors and the West at the end of the 1980s, the 1990s began with punishment for Libya for its past terrorist activities. Libya was indicted in both the United States and the United Kingdom for its role in the December 1988 terrorist attack against the Pan Am Flight over Lockerbie, Scotland. In January 1992, the UN Security Council passed resolution 731, which

690 Ibid., 31.

691 Ibid.

condemned the downing of the Pan Am Flight over Lockerbie and of the Union Transports de Aeriens Flight 772 over Niger.[692] The UN Security Council expressed concern over the fact that Libyan officials were implicated in the attacks and requested that Libya support information requests by France, the United Kingdom, and the United States regarding the incidents.[693] In March 1992, the UN Security Council passed resolution 748, which called for all states to deny permission for Libyan aircraft to operate on their soil and to prohibit arms sales and technical assistance to Libya.[694] Resolution 883, passed in November 1993, froze the assets of the Libyan government and its officials along with the assets of Libyan commercial enterprises.[695] The resolution also tightened resolution 748, seeking to make it more effective in its targeting of Libyan airlines.[696]

In 1996, the United States expanded economic sanctions against Libya. The U.S. Congress passed the Iran-Libya Sanctions Act. The purpose of the legislation was to punish Libya for its pursuit of weapons of mass destruction and support for international terrorism by applying economic sanctions against companies doing business in Libya and Iran. The sanctions had the effect of limiting Libya's oil production capabilities.[697] Wyn Bowen assessed that "the combination of significantly lower oil revenues and the inability to expand oil production due to the embargoes, contributed to a general economic malaise."[698]

On the domestic front, Libya found itself confronting militant Islamists by the mid-1990s. Luis Martinez attributed the growth of this Islamist movement to poor

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692 United Nations Security Council, "Resolutions Adopted by the United Nations Security Council in 1992," 51, accessed June 27, 2016, http://www.un.org/en/sc/documents/resolutions/1992.shtml.

693 Ibid., 52.

694 Ibid., 53.

695 United Nations Security Council, "Resolution 883 (1993)" (New York: United Nations Security Council), 2, accessed June 27, 2016, http://www.un.org/en/ga/search/view_doc.asp?symbol=S/RES/883(1993).

696 Ibid., 2–3.

697 Bowen, *Libya and Nuclear Proliferation*, 54.

698 Ibid.

economic conditions and a decrease in government control.[699] In fact, Libya's leader Muammar Qaddafi was nearly assassinated by a militant group operating in Benghazi in 1998.[700] Bowen added that domestic support for these groups resulted from "the combined effect of sanctions, international isolation and the state's failure to manage the economy."[701]

It was at this difficult time for Libya that the country began to move toward greater openness. The *Washington Post* quoted Arab diplomats as stating in 1999 that Libya was demonstrating a "less ideological and more pragmatic policy."[702] In 1999, the Bill Clinton administration began secret discussions with Qaddafi regarding what Libya would have to do to have sanctions removed, according to Barbara Slavin.[703] Martin Indyk, who was then serving as Assistant Secretary of State for Near Eastern Affairs at the U.S. State Department, noted that Libya's offer to relinquish its nuclear program occurred in May 1999.[704] He argued that Libya's decision was prompted by a motivation to end "sanctions that prevented Libya importing oilfield technology" in order to increase oil production.[705] Qaddafi appeared to be anxious to have sanctions removed in whatever way possible, to include relinquishing Libya's nuclear program.

Qaddafi took steps to satisfy international demands. He handed two Libyan suspects in the Lockerbie bombing over to a Scottish court for trial and the UN sanctions were suspended in 1999.[706] Most European countries restored relations with Libya once

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699 Luis Martinez, "Libya: The Conversion of a 'Terrorist State,'" *Mediterranean Politics* 11, no. 2 (2006): 156, https://doi.org/10.1080/13629390600682883.

700 Ibid., 157.

701 Bowen, *Libya and Nuclear Proliferation*, 56.

702 Howard Schneider, "Libya, Seeking Investors, Moves from Fringe toward Mainstream," *Washington Post*, July 20, 1999.

703 Barbara Slavin, "Libya's Rehabilitation in the Works since Early '90s," *USA Today*, April 26, 2004, https://usatoday30.usatoday.com/news/world/2004-04-26-libya_x.htm.

704 Martin S. Indyk, "The Iraq War Did Not Force Gadaffi's Hand" (Washington, DC: Brookings Institution, March 9, 2004), http://www.brookings.edu/research/opinions/2004/03/09middleeast-indyk.

705 Ibid.

706 Martinez, "Libya: The Conversion of a 'Terrorist State,'" 153.

these sanctions ended.[707] Furthermore, after the Lockerbie issue was settled, regional states such as Saudi Arabia and the United Arab Emirates sought to rebuild trade relations with Libya.[708] In August 2003, Libya accepted responsibility for the Lockerbie bombing. The United States did not restore relations with Libya until after 2003.

b. Nuclear Program

Libya took steps to develop a nuclear weapons program throughout nearly the entire time period. In the early 1990s, Libya's efforts met with mixed results. For example, the Nuclear Threat Initiative noted that after the fall of the Soviet Union, Libya tried without success to recruit nuclear experts from Russia to work on the country's nuclear program.[709] Also, according to Albright, Libya ordered P-1 centrifuges from the A.Q. Khan network in the early 1990s, but they could not be delivered after the UN Security Council placed an air and arms embargo on Libya in 1992.[710] In addition, around 1992, a German engineer, who had worked to develop uranium gas centrifuge equipment at the Tajura Nuclear Research Center beginning in the early 1980s, left without creating a working centrifuge.[711]

In the mid-1990s, Libya began a concerted effort to expand its nuclear program with the assistance of the A.Q. Khan network. Libyan authorities informed the IAEA in 2004 that "Libya made a strategic decision to reinvigorate its nuclear activities, including gas centrifuge uranium equipment" in 1995.[712] Accordingly, Libya made major

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[707] Yahia H. Zoubir, "Libya and Europe: Economic Realism at the Rescue of the Qaddafi Authoritarian Regime," *Journal of Contemporary European Studies* 17, no. 3 (2009): 406, https://doi.org/10.1080/14782800903339354.

[708] Schneider, "Libya, Seeking Investors, Moves from Fringe toward Mainstream."

[709] "Profile for Libya—Nuclear," Nuclear Threat Initiative, accessed June 28, 2016, http://www.nti.org/learn/countries/libya/nuclear/.

[710] Albright, *Peddling Peril*, 119.

[711] International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement of the Socialist People's Libyan Arab Jamahiriya," February 20, 2004, 5; International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran.*, 100.

[712] International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement of the Socialist People's Libyan Arab Jamahiriya," February 20, 2004, 5.

purchases of centrifuges and components from the A.Q. Khan network beginning in 1997 and continuing until 2003, noted Albright.[713] In fact, the IAEA reported that the network provided 20 P-1 centrifuges already assembled and the components for 200 P-1 centrifuges in 1997.[714] The IAEA further asserted that, in September 2000, Libya ordered 10,000 P-2 centrifuges from A.Q. Khan and components for these centrifuges began arriving in December 2002.[715] Libya's deal with the A.Q. Khan network included P-1 and P-2 centrifuge blueprints, according to Albright.[716] In addition, Albright noted that the country ordered a gas centrifuge plant from the network.[717] Further, Libya advised the IAEA that it had obtained a machine shop to begin domestic production of the centrifuges.[718]

In tandem with Libya's cooperation with the A.Q. Khan network, Libya began to cooperate with Russia. In 1998, it signed a contract with Russia for a partial overhaul of the Tajura Nuclear Research Center, according to Cirincione, Wolfsthal, and Rajkumar.[719] In the late 1990s and early 2000s, Russia and Libya held discussions about assisting Libya with the research center and the construction of a power reactor.[720]

Libya seemed to advance its nuclear capabilities quickly in the early 2000s following the end of UN sanctions. The IAEA reported that, in October 2000, one of the twenty pre-assembled centrifuges acquired from A.Q. Khan was installed at Libya's Al-

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713 Albright, *Peddling Peril*, 121.

714 International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement of the Socialist People's Libyan Arab Jamahiriya," February 20, 2004, 5.

715 Ibid.; Albright, *Peddling Peril*, 120–22; "Profile for Libya—Nuclear."

716 Albright, *Peddling Peril*, 128.

717 Ibid., 121.

718 International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement of the Socialist People's Libyan Arab Jamahiriya," February 20, 2004, 5.

719 Cirincione, Wolfsthal, and Rajkumar, *Deadly Arsenals*, 322.

720 Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, July-Dec 1999"; Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, January–June 2003."

Hashan site and successfully tested.[721] Its report noted that Libya claimed no nuclear material was used while testing centrifuges.[722] Libya started to put in P-1 centrifuge cascades at Al-Hashan in late 2000 and the cascades were partially assembled by April 2002, according to the IAEA.[723]

Curiously, Libya was working to both develop its nuclear infrastructure and normalize its relationship with the United States and the West. For example, the Nuclear Threat Initiative noted that Qaddafi called for Arab states to develop a nuclear weapon in 1996.[724] Libya, however, also signed the African Nuclear Weapon Free Zone Treaty, the Treaty of Pelindaba, in 1996. The IAEA reported that, in 1998, Libya moved its pilot scale uranium conversion facility, acquired from the Japanese in 1984, out of storage and partly assembled the facility.[725] While Libya signed the Comprehensive Test Ban Treaty in 2001, it also received two tons of uranium hexafluoride from possibly Pakistan or North Korea.[726] Libya received the blueprint for a nuclear weapon from the A.Q. Khan network in late 2001 or early 2002.[727] Libya stated to the IAEA, however, that it did not have the personnel skilled to develop a nuclear weapon.[728] In February 2002, Libya conducted cold testing of the pilot uranium conversion facility from Japan, according to the IAEA.[729] In March 2002, Qaddafi asserted in a televised speech: "We demanded the dismantling of the weapons of mass destruction that the Israelis have; we must continue

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721 International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement of the Socialist People's Libyan Arab Jamahiriya," February 20, 2004, 5.

722 Ibid.

723 Ibid.

724 "Profile for Libya—Nuclear."

725 International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement of the Socialist People's Libyan Arab Jamahiriya," February 20, 2004, 4.

726 Ibid.; "Profile for Libya—Nuclear."

727 International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement of the Socialist People's Libyan Arab Jamahiriya," February 20, 2004, 6; Cirincione, Wolfsthal, and Rajkumar, *Deadly Arsenals*, 323.

728 "Profile for Libya—Nuclear," 6.

729 International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement of the Socialist People's Libyan Arab Jamahiriya," February 20, 2004, 4.

to demand that. Otherwise, the Arabs will have the right to possess that weapon."[730] In April 2002, however, the centrifuge equipment at Al-Hashan was taken apart and moved to Al-Fallah where most of the equipment remained in storage at the time of the February 2004 IAEA report.[731] The U.S. intelligence community's 2001 report to Congress summarized this bifurcated approach well. It noted that Libya had sought to expand its nuclear weapons program even as it pursued a rapprochement with the West.[732] Like Iraq, Libya was reaching out to the United States while it worked to strengthen its nuclear weapons capabilities.

Libya began to move more definitively toward denuclearization in 2003. In March, after first reaching out to British intelligence, Libya began negotiating with the United States and the United Kingdom regarding the dismantlement of its nuclear program, according to the Arms Control Association.[733] The IAEA reported that it was during this timeframe that Libya took apart the pilot uranium conversion facility received from the Japanese and moved it to Salah Eddin.[734] The negotiations stretched from March to December and Libya publicly renounced its program in December 2003. According to U.S. intelligence, "the Libyans made significant disclosures about their nuclear, chemical, and missile-related activities."[735] U.S. intelligence further noted that American and British experts visited Libya twice toward the end of the year and were "shown covert facilities and equipment and were told of years of Libyan efforts to

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730 John R. Bolton, "Beyond the Axis of Evil: Additional Threats from Weapons of Mass Destruction," Heritage Foundation, accessed August 27, 2016, http://www.heritage.org/research/lecture/beyond-the-axis-of-evil.

731 International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement of the Socialist People's Libyan Arab Jamahiriya," February 20, 2004, 5.

732 Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, July–December 2001."

733 "Chronology of Libya's Disarmament and Relations with the United States," Arms Control Association, September 2016, https://www.armscontrol.org/factsheets/LibyaChronology.

734 International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement of the Socialist People's Libyan Arab Jamahiriya," February 20, 2004, 4.

735 Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, July–December 2003."

develop weapons capabilities."[736] But, in a step backward for Libya's efforts to convince the West of its desire to end its nuclear program, the IAEA reported that, in October 2003, a ship called the BBC China carrying centrifuge equipment and destined for Libya was seized in the Mediterranean.[737] It was not clear if this interdiction should have been attributed to the Proliferation Security Initiative launched by the United States in May 2003 or ongoing efforts to unravel the A.Q. Khan network.

On December 19, 2003, Libya abandoned its weapons of mass destruction programs and Missile Technology Control Regime class missiles.[738] U.S. intelligence reported that Libya admitted to "nuclear fuel cycle projects that were ultimately intended to support a nuclear weapons program, including uranium processing and enrichment."[739] In addition, Libya promised to adhere to IAEA Safeguards as well as the Additional Protocol and to end its nuclear weapons program.[740] Finally, U.S. intelligence highlighted Libya admitted that the A.Q. Khan network had provided extensive nuclear assistance.[741]

The timeframe for Libya deciding to end its nuclear program had led to an alternate and more prevalent argument that the ending was directly related to security concerns resulting from the 2003 Gulf War. For example, Bahgat argued that the U.S. termination of Hussein's rule in Iraq motivated Qaddafi to end Libya's program.[742] If Indyk was correct that Libya reached out with an offer to end its nuclear program in 1999, the Second Gulf War would not be the driving force behind Libya's decision.

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736 Ibid.

737 International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement of the Socialist People's Libyan Arab Jamahiriya," February 20, 2004, 5.

738 Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, July–December 2003."

739 Ibid.

740 Ibid.

741 Ibid.

742 Bahgat, *Proliferation of Nuclear Weapons in the Middle East*, 145.

In regard to delivery systems, Libya aggressively worked to expand its missile program, primarily consisting of Scud-B missiles, with the goal of developing a medium-range ballistic missile or "extended-range scud" capability, according to U.S. intelligence.[743] And Bermudez noted that, throughout the 1990s, Libya pursued acquisitions despite the arms embargo.[744] Libya looked to various suppliers. Nuclear Threat Initiative wrote that interdiction operations netted missile parts en route to Libya from suppliers in Germany, Iran, North Korea, and Taiwan.[745] In 1996, the U.S. intelligence community reported to Congress that Libya sought "ballistic missile-related equipment, materials, and technology from Europe, the CIS, and the Far East."[746] Despite Libya's efforts, these interdictions combined with the effects of the UN embargo restricted Libya's missile acquisitions.[747]

Libya reinvigorated its procurement efforts in the early 2000s.[748] U.S. intelligence reported that the suspension of UN sanctions in 1999 was key to allowing Libya to move forward with missile development once again.[749] When Libya renounced its weapons of mass destruction programs and Missile Technology Control Regime class missiles in December 2003, however, it "provided extensive information on its Scud

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[743] Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, January–June 2000."

[744] Joseph S. Bermudez Jr, "Ballistic Missile in Development in Libya" (Jane's Intelligence Review, January 1, 2003), 5, www.janes.com.

[745] "Profile for Libya—Missile."

[746] Director of Central Intelligence, "The Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions: July–December 1996."

[747] Director of Central Intelligence, "Report of Proliferation-Related Acquisition in 1997"; Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, July-Dec 1999."

[748] Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, July–December 2000."

[749] Ibid.

missile inventory, its efforts to develop longer-range missiles, and the assistance it obtained from North Korea and other sources."[750]

c. Nuclear Trends

Libya pursued nuclear weapons until 2003 while enduring punishing economic sanctions. Libya showed a clear motivation to acquire a nuclear weapon. It admitted to acquiring components for a centrifuge enrichment capability along with nuclear weapons designs. The country went to significant lengths to acquire the technology to extend its missile capability.

What drove Libya's nuclear behavior? In the regional context, threats persisted. Iraq and Iran continued to pursue nuclear weapons. Israel's military power had not diminished. Three shifts occurred in Libya's nuclear program from 1991 to 2003. First, Libya continued its pursuit of nuclear capabilities at the beginning of the period and increased its efforts in 1995. Second, Libya reinvigorated both its nuclear and missile efforts in the early 2000s after sanctions ended. Third, in 2003, Libya voluntarily renounced its nuclear program. The Libyan case contrasts with Iraq, where the United States ended its program by force and UN sanctions and inspections kept it from being reconstituted.

The United States applied constant pressure on Libya due to its nuclear program and sponsorship of terrorism throughout the 1990s. U.S. and UN sanctions hindered Libya's nuclear efforts. While the United States was unaware of the magnitude of Libya's covert activities, it shined an international spotlight on the country and its nuclear and missile efforts. Libya expert Wyn Bowen assessed that:

> The Libyan case demonstrates that by means of a combination of targeted sanctions, political and diplomatic isolation, export controls and intelligence sharing on nuclear-related shipments and activities, the international community can make the acquisition of nuclear weapons prohibitively costly, in economic and political terms, and in the right

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[750] "Profile for Libya—Missile"; Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, July–December 2003."

context can prompt a unilateral decision to relinquish the pursuit of such weapons.[751]

After over a decade of diplomatic and economic pressure on Libya, there seemed to be no way forward for the country without complying with international demands. The United States was the driving force behind those demands.

5. Saudi Arabia

Saudi Arabia strengthened its security relationship with the United States beginning with the First Gulf War. The country was not prepared to repel Iraq's invasion of Kuwait on its own. Throughout the 1990s, the United States and Saudi Arabia expanded military relations. On the nuclear front, Saudi Arabia did not significantly advance its civilian or military nuclear capabilities. The only concern emerged when a rumor circulated regarding possible acquisition by Saudi Arabia of a nuclear deterrent from Pakistan.

a. Political Context

Shifting political alliances characterized the beginning of the 1990s for Saudi Arabia. Saudi Arabia had supported Iraq against Iran during the Iran-Iraq War of the 1980s, but Iraq's 1991 invasion of Kuwait alarmed Saudi Arabia. In addition, Iraq launched Scud missiles at Saudi Arabia. In response, Saudi Arabia mobilized regional states against Iraq and reached out to the United States for military assistance. Iraq had the strongest army in the Middle East at the time and Saudi Arabia welcomed assistance to confront Iraq. The United States, which also had a strategic interest in the stability of the Arabian Peninsula, stepped in to help its Gulf allies. This action exemplified Saudi Arabia's approach to handling large regional security issues. Bahgat Korany and Moataz Fattah noted that Saudi Arabia governed by relying on "the ulama for domestic control and legitimacy" and on "the U.S. for international security."[752]

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751 Bowen, *Libya and Nuclear Proliferation*, 82.

752 Korany and Fattah, "Irreconcilable Role-Partners? Saudi Foreign Policy Between the Ulama and the U.S.," 345.

Catering to its domestic audience, the Saudi rulers received the blessing from the ulama to have the U.S. military on Saudi soil. The U.S. military presence in Saudi Arabia was controversial because Saudi Arabia hosts Islam's holy sites of Mecca and Medina and Saudi Arabia worked to mitigate the backlash from the U.S. military presence on its soil. Saudi Arabia shielded itself from some criticism by receiving troops from Egypt, Syria, and Morocco along with Pakistan, Bangladesh, Senegal, and Afghanistan during the First Gulf War.[753]

A U.S.-led coalition quickly ejected Iraq from Kuwait. After the conflict, the Gulf States solidified their relationship with the United States and Saudi Arabia expanded its military relationship with the superpower.[754] Saudi Arabia and the other Gulf States looked to the United States to ensure their security and provide conventional military equipment. Foley wrote that they "continued to make significant arms purchases after the war. . . . These costs, however, were seemingly worth the investment to the Gulf States. U.S. power had freed Kuwait and protected the regional states from a very real threat in 1991 as well as from Iraq and Iran in subsequent years."[755] Throughout the 1990s and early 2000s, this close security relationship between the United States and its Gulf state allies, especially Saudi Arabia, continued.

Tensions arose between Saudi Arabia and the United States after the terrorist attacks of September 11, 2001, in New York City and Washington, DC. Fifteen of the nineteen terrorists were from Saudi Arabia. Further, the mastermind of the attacks Osama Bin Laden, a Saudi citizen, had spoken out publicly against the presence of U.S. troops on Saudi soil since the early 1990s.[756] These tensions, however, did not permanently disrupt relations between the two countries. In fact, Saudi Arabia sought to cooperate with the United States in its "war on terror" that followed the 2001 attacks.

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753 Kifner, "Confrontation in the Gulf; Badly Divided Arab League Votes To Return Headquarters to Cairo."

754 Foley, *The Arab Gulf States*, 102.

755 Ibid.

756 Christopher M. Blanchard, "Al Qaeda: Statements and Evolving Ideology," Report for Congress (Washington, DC: U.S. Library of Congress, Congressional Research Service, January 26, 2006), 2, http://fpc.state.gov/documents/organization/61499.pdf.

Regionally, Saudi Arabia's historical friendships and enmities continued. Saudi Arabia refused to recognize the state of Israel. It worried about the military capabilities of Iran and Iraq. It maintained cordial relationships with Egypt, Lebanon, Jordan, and Syria. Finally, it served as a regional leader for the Gulf States, intervening in domestic disputes when it deemed necessary, especially Yemen's civil strife.

b. Nuclear Program

Saudi Arabia took small steps to build its knowledge of nuclear technology from 1991 to 2003. For example, in the early 1990s, it undertook a study on power plant equipment.[757] It did not make any significant progress, however, and Saudi Arabia's nuclear intentions were not called into question.

This changed in the late 1990s and early 2000s, however, when rumors circulated regarding a nuclear relationship between Pakistan and Saudi Arabia. The country's defense minister aroused suspicion when he traveled to Pakistan's nuclear research center in 1999 and 2002.[758] A British newspaper reported in September 2003 that Saudi Arabia was considering policy options of acquiring "a nuclear capability as a deterrent," relying on "an alliance with an existing nuclear power that would offer protection," or trying "to reach a regional agreement on having a nuclear-free Middle East."[759] Another newspaper alleged in November 2003 that Pakistan had agreed to provide Saudi Arabia with a nuclear bomb, if Saudi Arabia requested it.[760] Saudi Arabia denied the allegations and no further evidence emerged to substantiate these claims.

In addition, Saudi Arabia voiced its concerns regarding the nonproliferation regime. During the negotiations leading up to the 1995 indefinite extension of the NPT, Saudi Arabia protested Israel's non-signatory status. While Saudi Arabia did eventually

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757 International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran.*, 41.

758 Mark Urban, "Saudi Nuclear Weapons 'On Order' From Pakistan," *BBC News*, November 6, 2013, sec. Middle East, http://www.bbc.com/news/world-middle-east-24823846.

759 Ewen MacAskill and Ian Traynor, "Saudis Consider Nuclear Bomb," *The Guardian*, September 18, 2003, sec. World news, https://www.theguardian.com/world/2003/sep/18/nuclear.saudiarabia.

760 Urban, "Saudi Nuclear Weapons 'On Order' From Pakistan."

support the NPT extension, it did not sign the Additional Safeguards agreement or the Comprehensive Test Ban Treaty. Thomas Lippman assessed that Saudi Arabia's actions regarding the NPT extension likely served as a protest.[761]

Saudi Arabia continued its complaints in international venues about Israel. In 1999, Saudi Arabia's ambassador to the United Nations Fawzi Shobokshi made a strongly worded statement regarding the country's dissatisfaction with the lack of advancement of nonproliferation objectives in the Middle East. Shobokshi noted that

> while many regions around the world are achieving success in establishing nuclear free zones as a result of the cooperation and recognition of the need for peaceful co-existence among their countries, we find that the international and regional efforts to make the Middle East a nuclear free zone are fruitless. This is the result of the refusal of one country, namely Israel, to cooperate with these efforts.[762]

In terms of delivery systems, Saudi Arabia still maintained the CSS-2 missiles it had acquired in the late 1980s, but it did not acquire more missiles. Furthermore, it seems unlikely that China would have risked its nuclear cooperation agreement with the United States in order to upgrade Saudi Arabia's old missiles with nuclear warheads.[763]

c. Nuclear Trends

Saudi Arabia's nuclear capabilities—in terms of fissile material, a delivery system, or a warhead—did not increase over this period. They did not advance beyond the 1987 acquisition of intermediate-range ballistic missiles. The one question regarding Saudi Arabia's regional nuclear intentions stemmed from the alleged Saudi-Pakistani discussions about assistance with a nuclear deterrent. If there was truth in the rumors, it might have indicated that Saudi Arabia had greater security concerns than were outwardly apparent. If the rumors were not true, it might have signaled that Saudi Arabia

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761 Lippman, "Saudi Arabia," 117.

762 Fawzi Abdul Majid Shobokshi, "Statement of Kingdom of Saudi Arabia before the Third Session of the Preparatory Committee for the 2000 Review Conference on Non-Proliferation of Nuclear Weapons Treaty," Ministry of Foreign Affairs, Saudi Arabia, May 10, 1999, http://www.mofa.gov.sa/sites/mofaen/ServicesAndInformation/Letters/Committees/Pages/NewsArticleID35135.aspx.

763 Lippman, "Saudi Arabia," 134.

felt secure within the regional dynamic, bolstered by U.S. assistance. Regardless of possible intentions, Saudi Arabia did not seem to advance its nuclear capabilities.

What drove Saudi Arabia's nuclear behavior? In the regional context, was Israel Saudi Arabia's primary security concern? Lippman argued that Saudi statements about Israel were "rhetorical folderol."[764] Also, one can quickly point to several neighboring states that had sought to improve nuclear capabilities and ballistic missile arsenals over the period, namely Iraq, Iran, Libya, and Syria. Saudi Arabia was not on good terms with any of these countries. Further, both Iraq and Iran had posed a direct threat to the Kingdom. Saudi Arabia had a number of regional motivations to secure the ultimate deterrent. The fact that it did not advance its nuclear capabilities during this period speaks to the power of U.S. influence.

6. Syria

Syria improved its relationship with the United States after the end of the Cold War through supporting the First Gulf War and participating in the Madrid Conference. By the end of the period, however, Syria's relationship with the United States and neighboring states had deteriorated again. In regards to its nuclear program, Syria began to work on a secret nuclear project aided by North Korea in the mid-1990s. Syria also improved its missile capabilities.

a. Political Context

International and domestic shifts caused Syria to seek to redefine itself in the Middle East during the 1990s and into the 2000s. While Syria had traditionally been aligned with the Soviet Union, it joined the U.S.-led coalition in the First Gulf War to drive Iraq from Kuwait. An improved relationship with the United States benefited Syria as its traditional ally and primary weapons supplier, the Soviet Union, dissolved in December 1991.

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[764] Ibid., 117.

After the end of the First Gulf War, Syria agreed to participate in Arab-Israeli peace talks – an initiative led by U.S. President George H. W. Bush. This led to the Madrid Conference held in October 1991 attended by Israel, Egypt, Syria, Lebanon, and a Jordanian-Palestinian delegation.[765] The United States and the Soviet Union led the conference. Israel and Syria held bilateral talks in Washington, DC, after the conference. The two countries continued peace talks in 1994 at the Wye Plantation in Maryland, but broke them off in 1996.[766] It was remarkable that Syria was willing to hold talks with Israel, given its strong stance against relations between Middle Eastern states and Israel. Raymond Hinnebusch explains Syria's behavior by noting:

> In parallel with the fall of Syria's Soviet patron and the 1990s peace process, external aid declined and the Ba'ath's nationalist policy now collided with the imperative to access inward investment as a substitute for aid. This contradiction was buffered by revenues from Syria's own modest oil reserves, but these were also expected to decline in the 2000s; in the meantime, Syria pursued, under U.S. auspices, the possibility of a peace settlement with Israel that would satisfy nationalist legitimacy yet open the door to foreign aid and investment.[767]

Furthermore, Hinnebusch states that "the peace process was paralleled by a fall in military spending from about 18 percent of GNP between 1976 and 1988 to 7 percent in the 1990s."[768] Thus, it seems that economic motivations drove Syria's newly found efforts to cooperate.

Syria continued its willingness to dialogue with Israel even as Syrian president Hafez al-Assad's health deteriorated. Israel and Syria resumed peace talks in January 2000 in West Virginia hosted by the United States. Possibly Assad sought to complete an agreement before his son, Bashar, took power.[769] The two countries did not return for

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765 U.S. Department of State, Office of the Historian, "The Madrid Conference, 1991."

766 Henry Siegman, "Being Hafiz Al-Assad: Syria's Chilly but Consistent Peace Strategy," *Foreign Affairs*, June 2000, https://www.foreignaffairs.com/articles/syria/2000-05-01/being-hafiz-al-assad-syrias-chilly-consistent-peace-strategy.

767 Hinnebusch, "Syria: From 'Authoritarian Upgrading' to Revolution?" 97.

768 Ibid.

769 Siegman, "Being Hafiz Al-Assad."

further talks, however, and the elderly president died in June 2000. His son assumed power after him.

Syria's relationship with the United States remained stable under Bashar al-Assad at the beginning of the decade. He cooperated with the United States after the terrorist attacks of September 11, 2001. Syria also continued its policy of being the first line of Arab defense against Israel, angering the Israelis. The tide turned in terms of the U.S.-Syrian relationship in 2003, when Syria decided not to join the U.S.-led coalition against Iraq.

In terms of other regional relations, Syria remained closest to Iran, which it had supported during the Iran-Iraq War. Syria's relationships with the Arab Gulf states and Jordan improved after the First Gulf War when it joined the U.S.-led coalition to expel Iraq from Kuwait's borders; however, relations with Iraq, Egypt, and Turkey remained poor. Also, Syria continued interfering in Lebanese politics.

b. Nuclear Program

Syria sought to advance its nuclear capabilities without its benefactor, the Soviet Union, in the early 1990s. In 1991, a 1985 Syrian-Soviet agreement to build a research reactor ended because of a financial disagreement.[770] Nevertheless, Syria continued to pursue the acquisition of a nuclear reactor.[771] First, the country expressed interest in buying a research reactor from India.[772] It was China, however, that began to construct a research reactor, the SRR-1—a miniature neutron-source reactor—at Dayr Al Hajar and provided reactor fuel.[773] This light-water research reactor went critical in 1996. While the reactor could not produce fissile material, it was used for training and research.[774]

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770 International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran*, 76.

771 Ibid., 77.

772 Ibid.

773 Ibid.

774 Ibid.

Syria turned to another nuclear supplier in the mid- to late 1990s. In 1997, Syria and North Korea began to cooperate on nuclear issues. The U.S. intelligence community indicated that "cooperation between North Korean nuclear-related personalities and entities and high-level Syrian officials began probably as early as 1997, which . . . puts it into the Hafez al-Assad regime in terms of the original decision to begin this cooperation."[775] U.S. intelligence acquired information beginning in 2001 regarding interactions "between North Korean nuclear entities and high-level Syrian officials."[776] U.S. intelligence noted additional interactions in 2003 and judged that they were likely related to nuclear proliferation.[777]

While Syria appeared to cooperate clandestinely with North Korea, it claimed it did not receive nuclear material from another illicit supplier—the A.Q. Khan network. A.Q. Khan came to Syria to give lectures on nuclear issues in late 1997 and 1998, according to the International Institute for Strategic Studies.[778] Syria asserted, however, that it did not make any nuclear supply agreements with Khan.[779]

Russia began providing assistance to Syria in the late 1990s. The two countries signed a nuclear agreement in 1999.[780] It involved plans for a desalination plant and a light-water reactor, but, as of 2003, little progress had been made.[781] In January 2000,

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[775] Office of the Director of National Intelligence, "Background Briefing with Senior U.S. Officials on Syria's Covert Nuclear Reactor and North Korea's Involvement," Office of the Director of National Intelligence, April 24, 2008, 2, https://www.dni.gov/files/documents/Newsroom/Speeches%20and%20Interviews/20080424_interview.pdf .

[776] Ibid., 1.

[777] Ibid., 2.

[778] International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran.*, 80.

[779] Ibid.

[780] Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, July-Dec 1999."

[781] International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran.*, 77–78.

Russia approved a program for cooperation with Syria on civil nuclear power.[782] In March 2003, Russia agreed to construct a desalination plant in Syria.[783] Meanwhile, the U.S. intelligence community expressed concern that Russian nuclear assistance would allow Syria to build indigenous nuclear capabilities.[784]

As part of Syria's traditional role of confronting Israel, Syria fought against the indefinite extension of the NPT in 1994 due to Israel's non-signatory status. The NPT extension passed in 1995 after a resolution on the Middle East was included backing the creation of a weapons of mass destruction free zone in the region. In 2003, Syria, as a non-permanent member of the UN Security Council, unsuccessfully pushed for a UN resolution for all regional states to join the NPT.[785]

During this period, Syria continued to expand its missile program and capabilities. The Wisconsin Project noted that, in 1994, Syria tested a North Korean Scud-C missile, and, in 1996, Syria reportedly tested a 600 km range Scud-C.[786] Demonstrating advances in its missile program, Syria successfully test fired a Scud-D missile in 2000, according to the Wisconsin Project.[787]

Syria conducted this work with third country assistance, especially from North Korea and Iran. From 1997 through the early 2000s, Iran assisted Syria with solid-

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782 Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, January–June 2001."

783 Leon Fuerth, "Turkey," in *The Nuclear Tipping Point: Why States Reconsider Their Nuclear Choices*, ed. Kurt M. Campbell et al. (Washington, DC: Brookings Institution Press, 2004), 159.

784 Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, January–June 2001"; Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, July–December 2003."

785 International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Ira.*, 79.

786 "Syria Missile Milestones—1972-2005," The Risk Report (The Wisconsin Project on Arms Control, October 2005), http://www.wisconsinproject.org/countries/syria/syria-missile-miles.html.

787 Ibid.

propellant missile development.[788] Russia, China, and North Korea helped Syria with liquid-propellant missile development.[789] As of 2008, North Korea had provided upwards of 60 Scud-C missiles since 1991 and 50 Scud-D missiles along with seven transporter erector launches in 2000, according to the International Institute for Strategic Studies.[790] In late 2002 and into 2003, North Korea and Iran may have been helping Syria to develop Scud-D missiles.[791]

c. Nuclear Trends

By the end of 2003, Syria had begun to expand its nuclear program through covert cooperation with North Korea. This cooperation appeared to begin in 1997. The two countries further advanced their nuclear cooperation in 2001 after Bashar Al-Assad came to power following his father's death. Syria also worked with Iran, North Korea, China, and Russia to improve its delivery systems. Thus, Syria's program seemed to shift forward twice during this period as it took steps to acquire more advanced nuclear technology and delivery systems.

What drove Syria's nuclear behavior during this period? Given Syria's weak economy, limited infrastructure, and lack of specialists in the nuclear field, it seemed unlikely that Syria would seek to develop nuclear weapons.[792] In the regional context, Syria was a minor power in a region filled with turmoil and it continued to have an

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788 Director of Central Intelligence, "Report of Proliferation-Related Acquisition in 1997"; Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, July–December 2003."

789 "Profile for Syria—Missile"; Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, January–June 1999"; Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, July–December 2002."

790 International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Ira.*, 76.

791 Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, July–December 2002"; Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, July–December 2003."

792 International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran*, 81–82.

ongoing conflict with Israel. Regional conflict and rivalry seemed to spur Syria toward nuclear proliferation. This motivation was complemented by access to nuclear suppliers willing to provide covert assistance.

7. Turkey

During this period, Turkey remained focused on a domestic threat, the Kurdistan Workers' Party insurgency. Any cross-border issues with its neighbors often were related to fighting this insurgency. Otherwise, it generally had few conflicts with regional states. The country's defense establishment maintained a Western focus and aspired to become a member of the European Union. On the nuclear front, Turkey sought to move forward with constructing nuclear power plants, but was stymied by various technical and financial issues.

a. Political Context

In the 1990s and early 2000s, Turkey's security concerns were driven by the threat from an internal Kurdistan Workers' Party insurgency and the two wars involving its southern neighbor Iraq. These two issues were tied together. In addition to the general instability resulting from U.S.-led military actions in Iraq, the no-fly zone in northern Iraq to protect Iraq's Kurdish population was a cause for concern in Turkey. Its anxiety stemmed from the fact that increased autonomy for Iraq's Kurds might make Turkey's Kurdish population push for more independence. Furthermore, Turkey's Kurdistan Workers' Party insurgency was a source of conflict with its neighbors, particularly Iran and Syria, due to cross-border issues involving Kurdish populations in these countries.[793] For example, a war nearly began between Turkey and Syria over Kurdistan Workers' Party leader Abdullah Ocalan's presence in Syria.[794]

In terms of other regional relations, Turkey maintained good relationships with Israel, Egypt, the Gulf States, and the countries in the Levant, with the exception of Syria

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[793] Jessica C. Varnum, "Turkey in Transition," in *Forecasting Nuclear Proliferation in the 21st Century: Volume 2, A Comparative Perspective*, ed. William Potter and Gaukhar Mukhatzhanova (Palo Alto, CA: Stanford Security Studies, 2010), 250.

[794] Ibid.

due to the Kurdish issue. Despite some border tensions, Turkey and Iran remained trading partners. By the early 2000s, Iran was sending natural gas to Turkey via a newly constructed Iran-Turkey pipeline.

In terms of its relationship with the United States, Turkey had been a close U.S. ally dating back to the end of World War II. As in other Middle Eastern countries, however, there was strong domestic opposition in Turkey to the war. This led to complications regarding U.S. use of Turkish territory for the war and the United States relied on other regional states for assistance in this regard.

During this period, the country also struggled to maintain the secular identity enshrined by its founder Mustafa Kemal Ataturk. While Turkey had historical ties to the Middle East and was a Muslim country, Turkey's leadership identified the country with secularism and the West. Also, Turkey continued negotiations to join the European Union. The 1997 political coup in Turkey served as an example of this political struggle. Described as a "post-modern" coup, Turkish military leadership forced Prime Minister Necmettin Erbakan from power without taking any military action.[795] The military claimed that it carried out the coup in order to curb the influence of Islamist political figures and promote a secular government. Furthermore, Turkey's Defense White Paper written in 2000 promoted a Western and secular vision of Turkey. It stated that Turkey "with a great majority of its population being Muslim, has adopted the western civilization as a model to be implemented from the date of its establishment until the present, condemns all religious fundamentalist currents, from whichever religion they originate."[796] The paper offered that Turkey was a model to "moderate Islamic countries and the Central Asian Republics" and that Turkey would "continue to form the greatest obstacle for the export of the religious fundamentalism movement to Europe."[797] Finally,

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795 "Turkey Opens Trial Over 1997 'Post-Modern' Coup," *BBC News*, September 2, 2013, http://www.bbc.com/news/world-europe-23925035.

796 Turkish Ministry of National Defense, "Defense White Paper 2000" (Ankara, Turkey, 2000).

797 Ibid.

Turkey described itself as "a reliable ally of NATO and a candidate member of the EU."[798]

Regionally, Turkey faced few threats from other Middle Eastern states during this period. Its military remained oriented to combating an internal insurgency. The political conflicts within Turkey's government highlighted the dual identity of the country as both a Muslim, Middle Eastern country and a proud North Atlantic Treaty Organization member with a European orientation. Nevertheless, the country seemed to begin to tilt toward the Middle East and away from the West following the end of the Cold War.

b. Nuclear Program

Turkey remained committed to acquiring nuclear power. It made assessments in the early 1990s as to future energy needs and the results of the analysis called for about 35 nuclear power plants.[799] Turkey pushed forward its plan for nuclear power again in the late 1990s. Turkey solicited bids for a nuclear power plant at Akkuyu Bay, but the initiative ended in 2000 due to financial issues. Then, in 2002, the AK Party (the Justice and Development Party), a conservative party with Islamist roots, led by Recep Tayyip Erdogan came to power in Turkey. As part of its platform, it "reintroduced the issue of nuclear power as one of the major energy sources to reduce supply security risks caused by the dominance of imported fuels, and to ensure diversity in power generation."[800] After entering office, Erdogan continued to pursue a nuclear power option as part of Turkey's energy policy.

Meanwhile, in 1994, Turkey partially converted its research reactor, Turkish Reactor 2, to run on low enriched uranium fuel. In order to conduct a safety review, the reactor was shut down in 1995 and resumed operations in 1998.[801] An earthquake shook the region in 1999 prompting additional reviews, although the reactor was not

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798 Ibid.

799 Kibaroglu, "Lessons from Turkey's Long Quest for Nuclear Power," 173.

800 Ibid., 178.

801 International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran*, 63.

damaged.[802] The earthquake prompted a technical cooperation project between IAEA and the Turkish Atomic Energy Authority. The organizations assessed that the reactor would not likely be harmed in the event of another earthquake.[803] The Turkish Reactor 2 remained in operation.

While Turkey worked to expand its nuclear infrastructure, Turkey's nuclear role in the North Atlantic Treaty Organization shifted in 1995. Robert Norris and Hans Kristensen noted that all of the North Atlantic Treaty Organization's B61 bombs in Turkey were removed from Akinci and Balikesir Air Bases and consolidated at Incirlik Air Base.[804] According to retired Turkish Air Force commander General Ergin Celasin,

> nuclear weapons that reportedly remain in Turkey cannot be linked to the Turkish military" and the Air Force's "role in NATO's nuclear contingency plans has come to an end with the withdrawal of nuclear weapons in the 1990s from the Air Force units that were deployed in several air bases in Turkey.[805]

Norris and Kristensen assert that since this withdrawal of weapons, "the number of 'Turkish' bombs at Incirlik AB has probably been reduced to 10–20 weapons to correspond to the inventories at other national bases" in Europe.[806] As of 2001, the base hosted 90 weapons, however, it was not clear that Turkey maintained an operational link to the weapons past the mid-1990s due to questions regarding whether Turkey's F-16s were equipped to carry the weapons.[807] Norris and Kristensen wrote that a U.S. Air Force nuclear-capable fighter wing was not permanently based at Incirlik.[808] According

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802 Ibid., 63–64.

803 Ibid., 64.

804 Norris and Kristensen, "U.S. Tactical Nuclear Weapons in Europe, 2011," 70.

805 Mustafa Kibaroglu, "Turkey and Shared Responsibilities," in *Shared Responsibilities for Nuclear Disarmament: A Global Debate*, ed. Scott D. Sagan et al. (Cambridge, MA: American Academy of Arts and Sciences, 2010), 27, http://carnegieendowment.org/files/saganInside.pdf.

806 Norris and Kristensen, "U.S. Tactical Nuclear Weapons in Europe, 2011," 70.

807 "Profile for Turkey"; Ibid.

808 Norris and Kristensen, "U.S. Tactical Nuclear Weapons in Europe, 2011," 69.

to Benjamin Loehrke and Alexandra Bell, this meant that, in a crisis, aircraft from other U.S. bases would have to deliver any Turkey-based U.S. nuclear weapons.[809]

Turkey had been an active participant in the nonproliferation regime. In the mid-1990s, Turkey became a signatory to several nonproliferation regime treaties. It signed the Comprehensive Test Ban Treaty in 1996 and ratified it in 2000. Turkey joined the Missile Technology Control Regime in 1997. It was the only country in the Middle East region to have acceded to the regime. Finally, it joined the Zangger Committee on nuclear exports in 1999. But, juxtaposed against these actions were remarks like those of a former Turkish transport minister, who, according to *Al-Hayat*, noted in 2000 that Turkey's "possession of the nuclear bomb will strengthen our security and enhance our deterrence amid this nuclear environment."[810]

In terms of delivery systems, Turkey began acquiring a ballistic missile capability in the late 1990s. According to Michael Barletta, it signed a contract in December 1995 for 120 Army Tactical Missile System missiles from the United States.[811] The missile had a range of 165 km, however, and could not be used to carry nuclear warheads.[812] Turkey turned to China for additional short-range ballistic missiles. The Nuclear Threat Initiative quoted Duncan Lennox as stating that Turkey produced the J-600T Yildirim I and the J-600T Yildirim II with China's assistance in the late 1990s.[813]

c. Nuclear Trends

Turkey did not advance toward an indigenous nuclear weapons capability during this period. In addition, according to the sources discussed here, it seems that the operational link between the U.S. nuclear weapons stored at Incirlik and Turkey's

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809 Benjamin Loehrke and Alexandra Bell, "The Status of U.S. Nuclear Weapons in Turkey," *Bulletin of the Atomic Scientists*, November 23, 2009, http://thebulletin.org/status-us-nuclear-weapons-turkey.

810 "Minister Reportedly Calls for Possession of Nuclear Bomb," *Al-Hayat* (in Arabic), March 14, 2000, quoted in Fuerth, "Turkey," 159.

811 Michael Barletta, "Mediterranean Countdown," *Bulletin of the Atomic Scientists* 54, no. 6 (November 1, 1998): 12, https://doi.org/10.1080/00963402.1998.11456894.

812 "Profile for Turkey."

813 Duncan Lennox, "B-611 (CSS-11) (China), Offensive Weapons," *Jane's Intelligence*, 3 August 2012, www.janes.com as quoted in "Profile for Turkey."

military likely ended in the mid-1990s. Furthermore, Turkey joined multiple nonproliferation treaties in the 1990s, further integrating itself into the nonproliferation regime.

What drove Turkey's nuclear behavior? In the regional context, Turkey's neighbors, Iran and Iraq, pursued nuclear weapons along with Libya. Turkey also faced periodic altercations with Iran, Iraq, and Syria related to the Kurdish issue. There are three reasons why Turkey likely did not pursue a nuclear weapons capability. First, Turkey's greatest perceived threat remained domestic. Its military's primary focus was the Kurdistan Workers' Party. Second, despite a reported operational planning shift for the delivery of U.S. nuclear weapons based in Turkey, Turkey did remain under the North Atlantic Treaty Organization nuclear umbrella. Third, it would have been hard to imagine a scenario where Turkey would risk support from the United States and the North Atlantic Treaty Organization to pursue nuclear weapons.

8. United Arab Emirates

The United Arab Emirates faced various regional threats during this period. Iraq's invasion of Kuwait was the most threatening and it motivated the United Arab Emirates to build a strong security relationship with the United States. Despite the challenges of regional conflict, the country did not increase its nuclear capabilities during this period in a significant way.

a. Political Context

Iraq's invasion of Kuwait marked a tumultuous beginning to the 1990s for the United Arab Emirates. The country supported the U.S.-led coalition that forced Iraq out of Kuwait in 1991. In order to assist the superpower, the United Arab Emirates offered up the Jebel Ali port in Dubai, which had the depth to host an aircraft carrier.[814] The port quickly gained in importance for the U.S. Navy.[815] Following the First Gulf War, the United Arab Emirates did not re-establish diplomatic relations with Iraq until 1998.

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[814] Foley, *The Arab Gulf States*, 97.

[815] Ibid.

Iran posed another significant threat to the country. The two countries had a long-running territorial dispute over three islands strategically located in the Persian Gulf—Abu Musa Island and the Greater and Lesser Tunbs Islands. In 1992, Iran upset the United Arab Emirates by taking over Abu Musa Island. Iran installed its military on the island and held military exercises.[816] In addition, Iran refused to discuss its seizure of the island.[817]

In order to help mitigate regional threats, including those posed by Iraq and Iran, the country forged close security ties with the United States.[818] In 1994, the United Arab Emirates and the United States signed a defense agreement.[819] As part of this agreement, the United States used the airbase at Al Dhafra for aerial operations.[820] Nevertheless, the United Arab Emirates did not support the U.S.-led coalition in the 2003 Second Gulf War.

Strengthened by its security relationship with the United States, the country began to play a greater regional role by the end of the period. For example, the United Arab Emirates provided military equipment to Lebanon and Yemen to assist with internal security issues in the early 2000s.[821]

b. Nuclear Program

During this period, the United Arab Emirates signaled its adherence to the nonproliferation regime and did not launch new efforts to build its nuclear infrastructure. In 1995, the Emirates became a signatory to the NPT. In addition, the country signed the accompanying Safeguards Agreement in 2002. This agreement entered into force in

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816 Ibid., 103.

817 Ibid.

818 Ibid.

819 International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran*, 54.

820 Ibid.

821 Alex Mello and Michael Knights, "West of Suez for the United Arab Emirates," War on the Rocks, September 2, 2016, http://warontherocks.com/2016/09/west-of-suez-for-the-united-arab-emirates/.

2003. The Emirates continued a number of ongoing technical cooperation projects with the IAEA.

The country did inadvertently play a role in proliferation activities during this period. The A.Q. Khan network hosted several meetings in Dubai, the country's business hub, according to Feroz Khan.[822] The meetings were between representatives of the A.Q. Khan network and Iran.[823] After these events, the country took measures to improve its export controls.[824]

Finally, the United Arab Emirates made no advances in terms of delivery systems. There seemed to be no indication that the country acquired additional ballistic missiles.

c. Nuclear Trends

The United Arab Emirates did not make progress toward weapons-relevant nuclear capabilities from 1991 to 2003. It did not take steps toward acquiring fissile material, a nuclear warhead, or a delivery vehicle. This occurred despite significant security threats to the Emirates from neighboring countries Iraq and Iran.

What drove the United Arab Emirates' nuclear behavior? In the regional context, Iran, Iraq, and Libya sought to advance their nuclear capabilities and Iran and Iraq might have been perceived as a direct threat given their proximity. Nevertheless, the Emirates' close relationship with the United States helped it to mitigate security concerns. In regards to the threat from Iraq, the Emirates actively supported the United States in its efforts to evict Iraqi forces from Kuwait in 1991. The military-to-military aspect of the bilateral relationship continued to grow throughout the period.

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822 Feroz Khan, *Eating Grass: The Making of the Pakistani Bomb* (Palo Alto, CA: Stanford Security Studies, 2012), 367–68.

823 Ibid.

824 "Profile for United Arab Emirates," Nuclear Threat Initiative, accessed July 22, 2015, http://www.nti.org/country-profiles/united-arab-emirates/.

9. Analysis

Nuclear proliferation efforts of two countries ended between 1991 and 2003—Iraq and Libya. Iraq's attempts to acquire a nuclear weapon were blocked by the First Gulf War and subsequent dismantlement of its nuclear program. Libya's pursuit of a nuclear weapon halted in 2003. By the end of 2003, the nuclear programs of both countries had terminated.

Nuclear proliferation activities in Iran and Syria continued beyond 2003. Iran's program continued throughout the period and the country increased its nuclear capability. The U.S. intelligence community's unclassified reports to Congress submitted from 1996 through 2003 expressed serious concerns regarding Iran's nuclear activities throughout the 1990s, more so than regarding the activities of Iraq and Libya. The Duelfer Report, which concluded that Iraq's program had effectively been terminated following the 1991 Iraq War, validated this focus. In addition, Syria acquired a nuclear reactor with the assistance of China and began cooperating secretly with North Korea to acquire nuclear technology.

What explains the overall decrease in nuclear proliferation behavior for the region from 1991 to 2003? This period stands in contrast to the previous period where nuclear proliferation increased. Given ongoing regional conflict and rivalry and a shift in the international system to a unipolar period, it would seem that nuclear proliferation should increase. Table 2 summarizes the decrease.

Table 2. Summary of Regional Nuclear Trends from 1991 through 2003

Egypt
No increase or decrease in nuclear proliferation.
Iran
Iran increased its nuclear capabilities from 1991 through 2002. In 2003, Iran halted its coordinated military nuclear program after revelations regarding its nuclear program by an opposition group. While Iran was driven to proliferate due to it rivalry with Iraq, its decision to halt its military program was due to superpower management.
Iraq
While Iraq sought to maintain its capacity for a nuclear weapons program, its overall capabilities decreased as a result of the First Gulf War in 1991 and the subsequent further dismantling of its program. This outcome was due to superpower management.
Libya
Libya increased its nuclear capabilities through the time period before announcing the end of the program in 2003. This outcome was due to external management.
Saudi Arabia
No increase or decrease in nuclear proliferation.
Syria
Syria began discussions regarding a nuclear reactor in 1997 and began more serious work in 2001. Syria's efforts were driven by regional rivalry.
Turkey
No increase or decrease in nuclear proliferation.
United Arab Emirates
No increase or decrease in nuclear proliferation.

B. VARIATIONS IN NUCLEAR PROLIFERATION BEHAVIOR: TESTING TWO THEORIES

Which theory better explains nuclear behavior during the second period? The first hypothesis based on Waltz's work is: Regional nuclear proliferation could increase during the second time period following the Cold War as a shift to a less stable unipolar international system occurs. The second hypothesis based on Paul's work is: Regional nuclear proliferation does not increase during the second time period due to a reduction in the intensity of regional conflict and rivalry in the region. Nevertheless, I found that there was no reduction in the intensity of regional conflict and rivalry in the region. Thus, was there a causal link between external management and an increase in nuclear proliferation

or a causal link between regional conflict and rivalry and an increase in nuclear proliferation? Were multiple regional states driving nuclear proliferation trends or was it the presence or absence of superpower management?

1. Testing Two Theories

The first hypothesis predicted nuclear proliferation could increase and the second hypothesis originally suggested it would not. Initially, Paul's theory appeared to best explain nuclear behavior during the period as the regional trend was toward a decrease in nuclear proliferation, but it did not. First, the region can still be described as a high-conflict zone. Regional nuclear proliferation decreased in spite of the persistence of conflict and rivalry. Second, the regional nuclear history shows that in a unipolar system, the sole superpower had greater latitude to combat nuclear proliferation and its external management efforts drove nuclear behavior.

External management efforts provide a better explanation for regional nuclear behavior, but not in the way that Waltz might initially suggest. Waltz argued that, under bipolarity, international involvement and "preponderant power" during the Cold War led to superpower management of regional states.[825] After the Cold War, this level of external management and general system stability ended. My research finds, however, that nuclear proliferation increased in the bipolar period and decreased in the unipolar period. A less permissive environment for nuclear proliferation spread existed during the unipolar period.

A closer look at Waltz's statements regarding preponderant power under unipolarity help explain these research results. First, with the end of the Soviet Union, the United States was "no longer held in check by any other country or combination of countries."[826] Second, writing in 2000, Waltz reminded us that the United States was "not just the dominant power in the world," but it was "a *liberal* dominant power."[827]

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825 Waltz, "The Stability of a Bipolar World," 888.

826 Kenneth N. Waltz, "The Emerging Structure of International Politics," *International Security* 18, no. 2 (October 1, 1993): 52, https://doi.org/10.2307/2539097.

827 Waltz, "Structural Realism after the Cold War," 23.

And this shaped the kinds of causes that the United States would expend its power and influence on. In this case, the United States pushed a nonproliferation agenda and reinforced the nonproliferation regime. It valued this agenda above selling nuclear technology. Russia, for example, seemed to be more driven by economic interests. Third, Waltz noted that the United States thought "of itself as acting for the sake of peace, justice, and well-being in the world," but that these terms "were defined to the liking of the powerful."[828] Limiting the spread of nuclear proliferation and expanding the nonproliferation regime were urgent tasks for the United States and it had a free hand to determine how to best accomplish these goals in the unipolar period. For example, Russia did not stand in the way of the United States as it led a coalition against Iraq in 1991 and 2003.

The United States as the sole superpower had greater latitude to pursue its interests in the international system. It did not have to concern itself with losing client states to another superpower or with superpower competition within the region. After the surprise of the extent of Iraq's nuclear capability in 1991, U.S. attention turned sharply to the issue of nonproliferation. The discovery of the lack of knowledge regarding Iraq's progress in its nuclear program prompted a higher level of scrutiny of potential proliferators than there had been during the bipolar period. U.S. policymakers expressed great interest regarding the state of weapons of mass destruction and delivery systems around the globe. The biannual reports on weapons of mass destruction requested by the U.S. Congress from the intelligence community and produced through the early 2000s bear witness to this interest.

Greater freedom of action allowed the United States to be able to pressure more effectively state nuclear suppliers such as China or pursue non-state nuclear suppliers such as the A.Q. Khan network. By the early 2000s, the United States had begun to unravel this network.[829] The United States also used economic sanctions as a tool to pressure possible proliferators. It was able to push through effective international

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[828] Ibid., 28.

[829] Albright, *Peddling Peril*, 208–9.

sanctions on Iraq, Iran, and Libya. These sanctions played an important role in limiting their nuclear efforts.

In Iraq, the United States forcefully ended the Iraqi nuclear program during the First Gulf War in 1991. UN dismantlement efforts, close monitoring, and UN sanctions following the war blocked Iraq from resuming its efforts. The Duelfer Report made it clear that Saddam Hussein unsuccessfully sought to maintain as much of the country's physical and intellectual nuclear capabilities as possible under sanctions. By 2003, Iraq's nuclear program was in shambles due to the destruction of nuclear facilities during the First Gulf War, the inspection regimen carried out in the early to mid-1990s, and sanctions levied against the country.

Libya worked to increase its nuclear capabilities at the beginning of the period. Nevertheless, the U.S.-led efforts to pressure Libya regarding its nuclear activities, especially through economic sanctions, seemed to have led Libya to reach out with an offer to give up its nuclear weapons program as early as 1999. Libya announced the end of its program in 2003. This outcome was driven by the United States.

Iran consistently worked to strengthen its nuclear weapons program until the early 2000s. After clandestine components of its program were revealed in the 2002 to 2003 timeframe, Iran opted to scale back its nuclear program. The IAEA and the U.S. intelligence community reported that Iran had an organized military nuclear program until around 2003.[830] Subsequently, Iran continued to develop its nuclear capabilities, but in a more ad hoc manner.

Syria began to make plans with North Korea for a secret nuclear reactor beginning in 1997.[831] Additional interactions between Syrian and North Korean officials in 2001 and 2003 were likely related to nuclear proliferation.[832] Working clandestinely

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[830] International Atomic Energy Agency, Board of Governors, Director General, "Final Assessment on Past and Present Outstanding Issues Regarding Iran's Nuclear Program"; Director of National Intelligence, "Annual Threat Assessment of the Intelligence Community for the Senate Select Committee on Intelligence, 2009," 19.

[831] Office of the Director of National Intelligence, "Background Briefing with Senior U.S. Officials on Syria's Covert Nuclear Reactor and North Korea's Involvement," 2.

[832] Ibid., 1–2.

with North Korea, this nuclear effort remained under the radar of the United States until the early 2000s.[833]

Why does the alternate hypothesis taken from Paul's work not provide sufficient explanatory power for regional nuclear trends? The evidence does not support the idea that the regional security environment drove proliferation trends in the Middle East. There were still an average of more than five militarized interstate disputes in a twenty-year time period, part of Paul's definition for a high-conflict zone. The conflict dyad of Iraq and Iran persisted even though the 1980s war had ended. Tension continued between the states of the Levant, particularly between Israel, Syria, and Lebanon, but did not break out into all-out war. The Gulf States, threatened by Iraq, invited the United States to intervene resulting in the First Gulf War. Thus, the Gulf States did not have to directly confront Iraq. Finally, both a strengthened autonomous Kurdish region and general instability due to the Iraq wars threatened Turkey, but did not result in outright inter-state war.

The regional trend away from an increase in nuclear proliferation was due to U.S. pressure and action. The historical evidence seems to indicate that without U.S. efforts, these countries' nuclear programs would likely have continued to move forward. The United States, however, inserted itself more forcefully in the regional security equation. The decrease in regional nuclear proliferation during this time period can be attributed to the unbounded actions of the sole superpower with a strong nonproliferation agenda.

2. Analyzing T.V. Paul's Data

This final section closely examines the data Paul used to support his theory. It includes an overview of the data on militarized interstate disputes, economic interdependence measured by regional trade, and the strength of regional organizations and alliances.

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[833] Ibid., 1.

a. Militarized Interstate Disputes

First, the number of militarized interstate disputes occurring between 1991 and 2003 in the region were as follows: Bahrain, 3; Egypt, 7; Iran, 25; Iraq, 30; Israel, 9; Jordan, 3; Kuwait, 11; Lebanon, 1; Libya, 2; Oman, 3; Qatar, 4; Saudi Arabia, 8; Syria, 10; Turkey, 40; the United Arab Emirates, 7; and Yemen, 5.[834] The leading states with militarized interstate disputes for this period were Iran, Iraq, and Turkey. There were more than an average of five militarized interstate disputes in a twenty-year period for the region. There was an average of nearly 13 militarized interstate disputes per year. This stands in contrast to the period from 1973 to 1990 when there was an average of nearly 20 militarized interstate disputes per year. In terms of significant conflict dyads, Iraq and Iran continued to be rivals. While Turkey had a high number of militarized interstate disputes, approximately 25 percent of Turkey's militarized interstate disputes were related to its internal Kurdish insurgency issue rather than a conflict of pure interstate origin. While the number of militarized interstate disputes decreased, the number that occurred remained characteristic of a high-conflict zone.

b. Economic Interdependence

Turning to Paul's second variable, regional economic interdependence continued to be low during this period.[835] On a country-by-country level, Figure 3 and Figure 4 make it clear which states were more regionally integrated for this period in terms of their import and export relationships.

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834 Palmer et al., "The MID4 Data Set: Procedures, Coding Rules, and Description."

835 Paul, *Power versus Prudence*, 22.

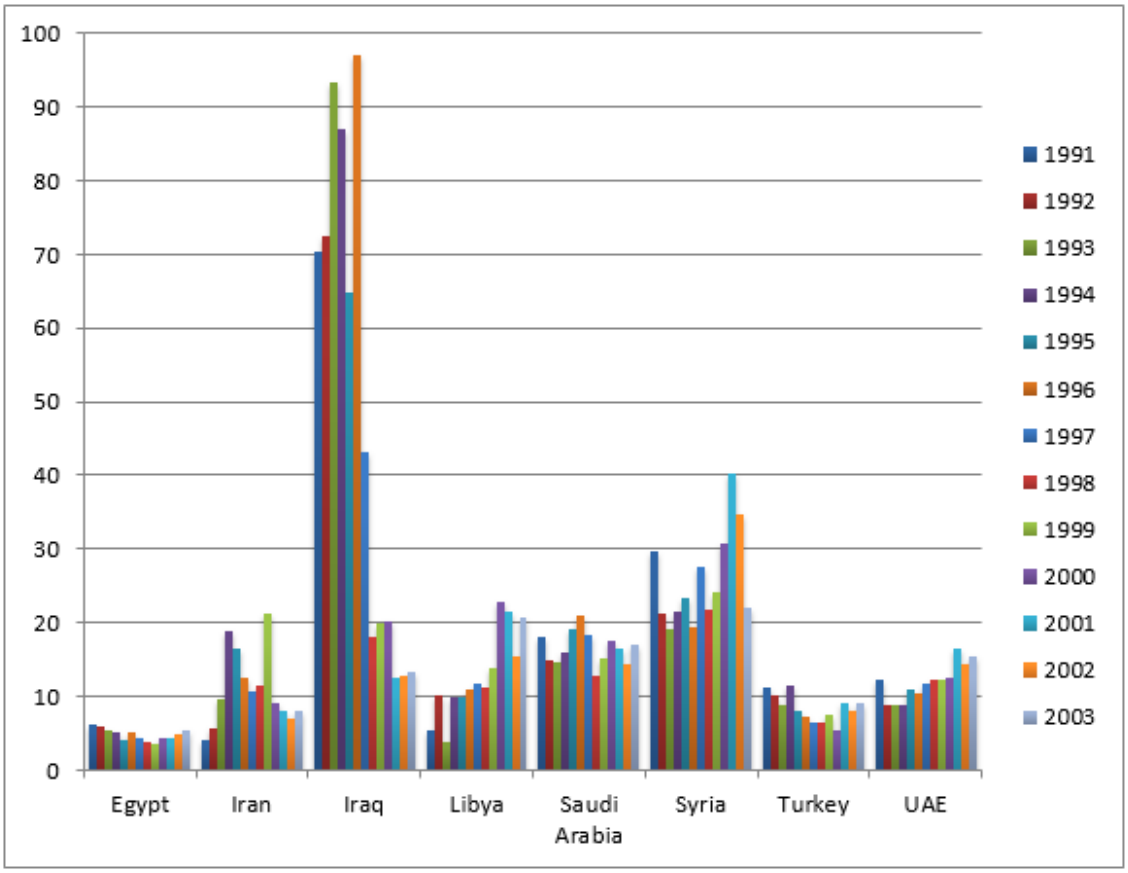

Figure 3. Regional Trade Integration, 1991 to 2003: Exports[836]

Regional export relationships from 1991 to 2003 averaged above 10 percent for Iran, Iraq, Libya, Saudi Arabia, Syria, and the United Arab Emirates. An increase in regional export integration occurred from the first period.

[836] Source: Data derived from International Monetary Fund, Direction of Trade Statistics.

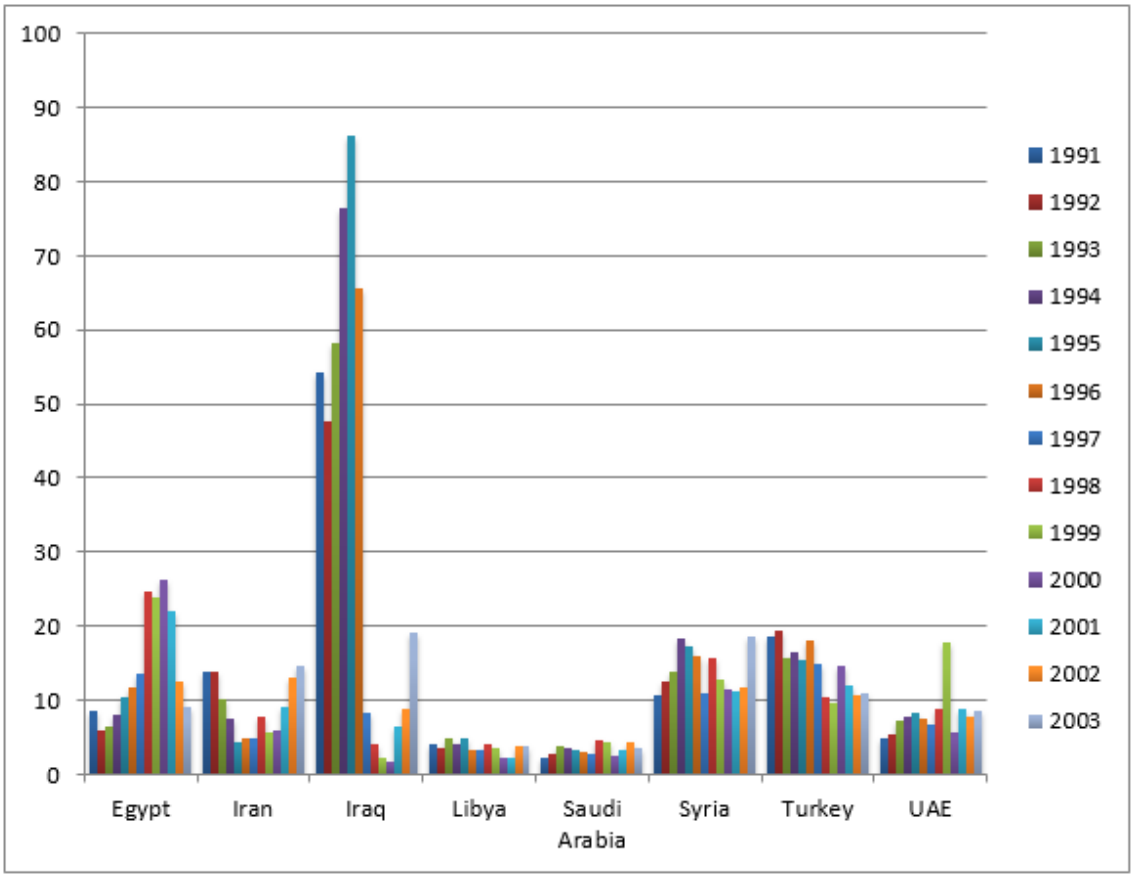

Figure 4. Regional Trade Integration, 1991 to 2003: Imports[837]

Regional import relationships from 1991 to 2003 averaged above 10 percent for Egypt, Iraq, Syria, and Turkey. For the remaining countries, including large economies like Saudi Arabia's, regional import relationships consisted of less than 10 percent of overall imports. A slight decrease occurred in regional import trade from the first period. Taking import and export data together, it appears that regional trade levels remained low.

c. Regional Organizations and Alliances

In terms of regional interdependence for this period, a survey of the regional organizations and alliances in the Middle East finds that they did not play a strong role in

837 Source: Data derived from International Monetary Fund, Direction of Trade Statistics.

Middle East relations. The possible exception to this was the Gulf Defense Pact signed in 2000, which reinforced the Gulf Cooperation Council. As noted in the first case study, according to Paul, a state's level of involvement correlates with whether they are in a zone of high, moderate, or low conflict.[838] In the latter, states are active members and become increasingly less so as the level of conflict increases.[839]

For this section, the regional organizations and alliances that were included had to meet the criteria of having existed between 1991 and 2003 and primarily involve regional states. The regional alliances that were in place for all or a part of this time period included the following: 1) the Arab League and its accompanying Treaty of Joint Defense and Economic Cooperation between the States of the Arab League; 2) the Council of Arab Economic Unity, supported by the Arab League; 3) the Gulf Cooperation Council; 4) the Arab Cooperation Council; and 5) the Economic Cooperation Organization.

The Arab League's members consisted of Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Oman, the Palestinian Territories, Qatar, Saudi Arabia, Syria, the United Arab Emirates, and Yemen. Other extra-regional states included Algeria, Comoros, Djibouti, Mauritania, Morocco, Somalia, Sudan, and Tunisia. The League continued to be criticized for its lack of accomplishments during this period. In particular, it was divided over how to respond to Iraq's invasion of Kuwait. Farah Dakhlal lah argued that

> the Arab League's performance during this period was dismal on four counts: 1) it failed to successfully resolve the Iraq-Kuwait dispute which eventually led to the invasion; 2) it failed to broker an agreement between Iraq and Kuwait after the invasion (which could have prevented foreign intervention); 3) it was visibly split into pro-Iraqi and anti-Iraqi camps; and 4) it was used to legitimize the foreign intervention that eventually occurred.[840]

838 Paul, *Power versus Prudence*, 20–21.

839 Ibid.

840 Farah Dakhlallah, "The League of Arab States and Regional Security: Towards an Arab Security Community?" *British Journal of Middle Eastern Studies* 39, no. 3 (December 1, 2012): 409, https://doi.org/10.2307/23525392.

Further, the League held no more than two summits during this period—once in 1990 and once in 1996.[841] The League, however, united behind several issues in the early 2000s. It put forward a serious Arab Peace Initiative in 2002. Then, in 2003, the League voted for U.S. and British soldiers to leave Iraq.

The League's Council of Arab Economic Unity created the Greater Arab Free Trade Area in 1997 in order to increase economic integration within the trade bloc. The bloc's members included Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, the Palestinian Territories, Qatar, Saudi Arabia, Sudan, Syria, Tunisia, the United Arab Emirates, and Yemen. The trade bloc appeared to lead to an overall increase in regional trade.[842]

The Gulf Cooperation Council continued to consist of Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates during this period. In 1994, the organization decided to remove the secondary and tertiary trade embargo against Israel and maintain only the primary boycott.[843] The Arab League had kept the boycott in place since Israel's founding in 1948 and criticized the decision by this sub-regional organization to break ranks with the greater Arab world. In addition, these Gulf countries signed a defense pact in 2000.

In 1992, the Economic Cooperation Organization added Afghanistan, Azerbaijan, Turkmenistan, Uzbekistan, Tajikistan, Kyrgyzstan, and Kazakhstan to its membership of Turkey, Pakistan, and Iran. This organization, thus, took a decided pivot to the east, expanding toward Central Asia rather than the Middle East.

Finally, the short-lived Arab Cooperation Council, which included Egypt, Iraq, Jordan, and North Yemen, ended in 1991 when its charter expired and was not renewed. The Council had sought to expand political and economic cooperation between its

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841 Ibid., 410.

842 Javad Abedini and Nicolas Péridy, "The Greater Arab Free Trade Area (GAFTA): An Estimation of Its Trade Effects," *Journal of Economic Integration* 23, no. 4 (2008): 848–72.

843 Martin A. Weiss, "Arab League Boycott of Israel" (Washington, DC: U.S. Library of Congress, Congressional Research Service, June 10, 2015), 3, https://www.fas.org/sgp/crs/mideast/RL33961.pdf.

members, but they were at odds regarding the organization's regional role.[844] Namely, Iraq wished for it to have a political focus and Egypt desired an economic focus.[845] Along with the Arab Maghreb Union, the founding of the Council had been a response to the formation of the Gulf Cooperation Council in the 1980s.

This data on militarized interstate disputes, economic interdependence, and regional alliances remained consistent with how Paul would characterize a high-conflict zone. There was a slight decrease in the number of militarized interstate disputes from the previous time period, but the decrease was not significant enough to characterize the region as a moderate-conflict zone. Also, regional trade and alliance organizations remained relatively weak.

C. CONCLUSION

By the end of 2003, nuclear proliferation efforts in the Middle East had decreased. This occurred despite the fact that the region continued to be classified as a high-conflict zone according to T.V. Paul's criteria. The United States, as the sole superpower, was the driving force behind this regional shift. In 1991, Iran, Iraq, and Libya had been pursuing nuclear weapons. By the end of the period, nuclear proliferation continued in Iran and now Syria, but had ended in Iraq and Libya. Iran also appeared to have ended its coordinated military nuclear program. This counterintuitive nuclear trend demonstrated that a less permissive environment for nuclear proliferation existed during the unipolar period than the bipolar period.

[844] Ryan, "Jordan and the Rise and Fall of the Arab Cooperation Council," 399.

[845] Ibid.

IV. REGIONAL HEGEMONY AND NUCLEAR PROLIFERATION: 2004–2013

In the setting of a multipolar international system, a time of increased instability, my international level hypothesis predicted an increase in nuclear proliferation, defined as progress toward weapons-relevant nuclear capabilities. The regional level hypothesis also projected greater nuclear proliferation in a time of rivalry and conflict in the Middle East. Contrary to both of these hypotheses, my research found that nuclear proliferation decreased from 2004 through 2013. Furthermore, it indicated that great power management of regional nuclear issues drove this outcome in the multipolar period and post-hegemonic nonproliferation cooperation bolstered these management efforts.

Kenneth Waltz would predict that with instability on a systemic level, nuclear proliferation should increase. T.V. Paul would predict that with high levels of conflict and rivalry, nuclear proliferation should increase. The empirical evidence shows that it did not. At the beginning of the period, Iran and Syria possessed clandestine nuclear programs. Syria's nascent efforts ended with an attack on its secret nuclear reactor in 2007. By 2013, only Iran remained as a possible nuclear proliferator and negotiations were underway to reduce that possibility. Despite Saudi Arabia's concern about Iran's nuclear program, the Kingdom did not appear to have acquired nuclear capabilities to compete with its regional opponent.

In addition, numerous regional states expressed interest in the mid-2000s in launching nuclear power programs; a nuclear renaissance seemed to be underway. Ten countries approached the International Atomic Energy Agency (IAEA) interested in developing nuclear power: Bahrain, Egypt, Jordan, Kuwait, Oman, Qatar, Saudi Arabia, Syria, Turkey, the United Arab Emirates, and Yemen.[846] This led to fears that the nuclear power plans doubled as a hedging strategy, spurred by concerns about Iran's nuclear program. By 2013, however, only the United Arab Emirates had begun construction of a nuclear power plant with the accompanying physical and legal infrastructure in place.

[846] William J. Broad and David E. Sanger, "With Eye on Iran, Rivals Also Want Nuclear Power," *New York Times*, April 15, 2007, http://www.nytimes.com/2007/04/15/world/middleeast/15sunnis.html.

But, the United Arab Emirates had agreed not to undertake domestic enrichment and reprocessing and put measures in place to prohibit this from ever taking place. Despite declared interest in building nuclear power programs, regional efforts fell short of an advance toward weapons-relevant nuclear capabilities.

While the international system became a multipolar system, several factors contributed to this downward trend. First, limiting nuclear proliferation continued to serve great power interests. A strengthened nonproliferation regime after the unipolar period aided great power efforts. Second, post-hegemonic cooperation in the context of the nonproliferation regime began to emerge. This was exemplified by the Iran negotiations initiated by Germany, France, and the United Kingdom.

This chapter investigates the regional nuclear trends from 2004 to 2013. The United States' post-Second Gulf War reconstruction efforts in Iraq mark the beginning of the period. The election of Hassan Ruhani as president of Iran and the beginning of the nuclear negotiations between the P5+1 and Iran mark its end.

As in prior chapters, the first section of this chapter tells the history of the states that have attempted or might have made an attempt from 2004 through 2013 to acquire nuclear weapons. These states include Egypt, Iran, Iraq, Libya, Saudi Arabia, Syria, Turkey, and the United Arab Emirates. This section describes the political setting for each country to provide context for each country's nuclear decision-making. Because the three major elements of a nuclear program are fissile material, a delivery system, and a nuclear warhead, the section also focuses on national efforts to build these nuclear components.

The second section uses ideas from Kenneth Waltz's *Theory of International Politics* to assess the degree to which the superpowers acted as international managers, constraining the nuclear ambitions of regional states. It also incorporates the competing hypothesis of regional security dynamics as described by T.V. Paul, which suggests that regional actors respond to regional threats, not superpower preferences, when it comes to their proliferation policies. This chapter will identify and assess the factors that drove nuclear behavior in the Middle East during this period.

A. REGIONAL NUCLEAR HISTORY

Under multipolarity, the United States continued to have an active role in the Middle East. Nevertheless, other great powers began to play prominent roles in the region as well. The U.S.-led coalition, primarily consisting of the United Kingdom and Australia, occupied Iraq after the Second Gulf War. Members of the coalition withdrew their troops gradually until the United States removed the last of its troops in December 2011. The United States and the United Kingdom worked together to dismantle Libya's nuclear program. Further, joint cooperation on sanctions between the United States, France, Germany, the United Kingdom, Russia, and China brought Iran to the negotiating table by 2013.

On the systemic level, what was the impact of an emerging multipolar international system on nuclear proliferation trends in the Middle East? What does the historical record say about how the United States or other great powers viewed their interests and roles in the region in regards to nuclear issues? How much leverage did they have over the acquisition of nuclear capabilities by Middle Eastern states? How did the great powers function as external managers?

On a regional level, high levels of conflict and rivalry continued to characterize interstate relations. There had been significant opposition to the U.S.-led Second Gulf War. Instability resulting from the conflict affected the states surrounding Iraq. Turkey expressed concern regarding the growing strength of the autonomous Kurdish region in northern Iraq. Iran interfered in Iraqi internal politics seeking to sway political outcomes in its favor. Syria allowed Al-Qaeda in Iraq to freely traverse its borders to escape U.S. military pressure in Iraq. In the Levant, war broke out between Lebanese Hezbollah and Israel in 2006. Israel emerged as the victor, but Hezbollah also won a victory in that it provided a higher level of resistance than expected.

Then, in late 2010, political protests began to erupt across the region beginning in Tunisia. Protests subsequently sprang up in Egypt, Jordan, and Yemen in January 2011; Libya, Bahrain, and Morocco in February 2011; and Syria in March 2011. The protest movement was labeled the "Arab Spring," in hopes that the countries' regimes would

become more democratic. The period has become known simply as the "Arab Uprising."[847] The protests resulted in regime change in Egypt and Libya, civil war in Syria and Yemen, and political settlements in Bahrain, Jordan, Morocco, and Tunisia. Regional powers worked to sway Arab Uprising outcomes. Hearkening back to Malcolm Kerr's work *The Arab Cold War*, there was discussion regarding a new "Arab Cold War."[848]

Furthermore, a power shift occurred during this period. The Gulf States began to play a more prominent role in regional politics, choosing sides in the Arab Uprising and providing them with military and / or economic support. Curtis Ryan assessed this was because the region's customary centers of power consisting of Egypt, Iraq, and Syria had diminished their roles in terms of regional security.[849] Iran continued its policy of supporting its interests in Syria and among Shia opposition groups in the region. Iran also often chose sides during the Arab Uprising – the opposite side of the Gulf States.

What was the impact of these regional rivalries on the Middle East? How did these states view their interests and roles in regards to nuclear proliferation? What drove nuclear proliferation in the region? To answer these questions, I first turn to Egypt.

1. Egypt

At the beginning of the period, Egypt played a traditional leadership role in the region, for example, by advocating for a resolution to the Israeli-Palestinian conflict. By 2011, however, Egypt was roiled by domestic strife as the Arab Uprising took root in the country. Egypt no longer held as prominent of a role in regional politics. The Gulf States, led by Saudi Arabia, had begun to play a greater role in intra-regional politics. This included seeking to influence domestic political outcomes in Egypt in the timeframe

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847 As an example of the decision to use the term "Arab Uprising" rather than "Arab Spring," see Nabeel A. Khoury, "The Arab Cold War Revisited: The Regional Impact of the Arab Uprising," *Middle East Policy* 20 (2013): 73–87, doi:10.1111/mepo.12021.

848 Malcolm H. Kerr, *The Arab Cold War: Gamal 'Abd Al-Nasir and His Rivals, 1958–1970*, Third Edition (London: Oxford University Press, 1971); Curtis Ryan, "The New Arab Cold War and the Struggle for Syria," *Middle East Research and Information Project*, no. 42 (Spring 2012), http://merip.org/mer/mer262/new-arab-cold-war-struggle-syria.

849 Ryan, "The New Arab Cold War and the Struggle for Syria."

surrounding the Arab Uprising. Despite the ongoing conflict, Egypt did not increase its nuclear capabilities. This occurred despite the calls by Egypt's Muslim Brotherhood for a nuclear deterrent and the push for a nuclear power program by the Egyptian government.

a. Political Context

Egypt continued to maintain a strong regional leadership role at the beginning of the period. Egypt, along with the Arab League, did not support the 2003 U.S.-led invasion of Iraq. This contrasted with the First Gulf War in 1991 where nearly the entire region supported the U.S.-led intervention. In regards to the Arab-Palestinian conflict, Egypt hosted Arab-Israeli negotiations at the Sharm el-Sheikh Summit in 2005 where the Al Aqsa Intifada formally ended.

In terms of Egypt's internal economic issues, Egypt's economic outlook was favorable. Debt forgiveness and economic reforms from the 1990s had begun to pay dividends. Also, efforts to augment investment in the country resulted in GDP increases from 2004 to 2006.[850] It concluded a free trade agreement with Turkey in 2005. During this timeframe, Egypt also worked with its neighbor Libya on oil and gas infrastructure development.

Regional and domestic political challenges increased in the mid-2000s. On a regional level, Egypt supported the Palestinian Authority, while Iran supported Hamas – the Palestinian opposition to the Palestinian Authority that had ties to the Muslim Brotherhood. Egypt had temporarily improved relations with Iran around 2007, but they deteriorated again during the 2008 to 2009 Gaza War. Given the Egyptian government's opposition to the Muslim Brotherhood domestically, it made sense that neither would it support a Muslim Brotherhood-affiliated group.

In addition, Egypt faced regional criticism for its lack of democracy. In 2007, the Qatari government, known to favor the Muslim Brotherhood, hosted a democracy

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[850] Ali E. Hillal Dessouki, "Regional Leadership: Balancing off Costs and Dividends in the Foreign Policy of Egypt," in *The Foreign Policies of Arab States: The Challenge of Globalization*, ed. Bahgat Korany and Ali E. Hillal Dessouki (Cairo: American University in Cairo Press, 2010), 174.

conference and invited members of the Egyptian political opposition.[851] Conference attendees strongly criticized the Egyptian government.[852] This was an initial indicator of Gulf State involvement in Egypt's internal affairs.

Domestically, Egypt continued to face opposition from Islamist parties and political groups, especially the banned Muslim Brotherhood. They called for greater democratization and participation in Egyptian politics. Richard Norton posited that Egyptian President Hosni Mubarak believed all Islamist groups were a political threat, even the more peaceful ones.[853] But, in 2005, Mubarak began to work towards competitive elections for the presidency along with constitutional reform that would limit the power of the presidency and expand the role of the legislature, urged by Egypt's ally the United States.[854] In the first elections in late 2005, Muslim Brotherhood politicians running as independents won over 20 percent of the parliamentary seats of the lower house.[855]

Opposition groups continued to agitate against the Mubarak government. Egypt's population joined the Arab Uprising movement in January 2011. Under pressure from the United States, Mubarak elected to step down from power in February. The Egyptian government removed the ban from Muslim Brotherhood participation in politics and the group formed the Freedom and Justice Party. Presidential elections were held in May 2012. Mohamed Morsi, the Freedom and Justice Party candidate, was declared the winner in June 2012.

Under Morsi, Egypt moved closer to Turkey, Qatar, and Iran. Turkey offered assistance to the opposition during Egypt's Arab Uprising and then quickly began to

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851 Ibid.

852 Ibid.

853 Augustus Richard Norton, "The Awakened Arab World and Its New Landscape," *The International Spectator* 48, no. 2 (June 1, 2013): 68, https://doi.org/10.1080/03932729.2013.789388.

854 Dessouki, "Regional Leadership: Balancing off Costs and Dividends in the Foreign Policy of Egypt," 178.

855 Ibid., 178–79.

work with the new Muslim Brotherhood-led government.[856] The new government viewed Turkey as a regional democracy to emulate.[857] Morsi visited Tehran in August 2012 – a first presidential visit since the 1979 Iranian Revolution. The new government admired Iran's opposition to Israel and the West.[858] Nevertheless, Iran and Egypt were divided regarding Syria's uprising. Morsi threw his support behind Syria's Sunni rebels and criticized the Iran-backed Syrian government in his speech at the Non-Aligned Movement summit held in August 2012 in Tehran.[859] But, Iranian President Mahmud Ahmadinejad still conducted a state visit to Egypt in early 2013. Finally, given Qatar's support to the Muslim Brotherhood, ties between Qatar and Egypt also grew stronger under Morsi.

Morsi used his Islamist political capital to negotiate a ceasefire between Hamas and Israel in late 2012, for which he received praise from U.S. President Barack Obama.[860] Reflecting on Morsi's foreign policy efforts, Nabeel Khoury argued that Egypt approached its foreign policy in a practical manner despite the fact that a Muslim Brotherhood party had come to power.[861] For example, Morsi's first state visits were to Saudi Arabia, China, and Iran.

Morsi's presidency came to an abrupt end, however, on July 3, 2013, following an eruption of protests similar to those of January 2011. The Egyptian military, led by Defense Minister Abdel Fattah el-Sisi, declared that it was suspending the constitution and put an interim government in place in order to restore stability and security. Morsi and a number of Muslim Brotherhood leaders were put in jail. The military also arrested employees of the Qatar-based Al Jazeera Network along with other Islamist media

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856 Khoury, "The Arab Cold War Revisited: The Regional Impact of the Arab Uprising."

857 Elizabeth Iskander Monier and Annette Ranko, "The Fall of the Muslim Brotherhood: Implications for Egypt," *Middle East Policy* 20, no. Winter 2013, No. 4 (n.d.), http://www.mepc.org/journal/middle-east-policy-archives/fall-muslim-brotherhood-implications-egypt.

858 Ibid.

859 Barbara Slavin, "Egypt's Morsi Upsets Iran," Al-Monitor, August 30, 2012, http://www.al-monitor.com/pulse/originals/2012/al-monitor/egypts-morsi-upsets-iran.html.

860 Norton, "The Awakened Arab World and Its New Landscape," 69.

861 Khoury, "The Arab Cold War Revisited: The Regional Impact of the Arab Uprising."

personalities.[862] Elizabeth Monier and Annette Ranko attributed the protests and unrest in Egypt to the Muslim Brotherhood's failure to improve democracy and social justice and failure to turn away from authoritarianism.[863] By the end of 2013, calls were mounting for Sisi to run for president and presidential elections were set for 2014.

After the coup, Egypt's old allies quickly returned to assist the Egyptian government, except for the United States. Saudi Arabia, the United Arab Emirates, and Kuwait offered U.S. $12 billion worth of aid to Egypt. Monier and Ranko wrote that the Gulf States were particularly concerned about a possible rise in transnational Islamism like the Muslim Brotherhood.[864] Oz Hassan added that the Egyptian military aligned itself with Saudi Arabia due to a shared interest in economic stability and maintaining the status quo.[865] The United States suspended its military aid to Egypt, citing its displeasure with the coup that overthrew a democratically elected president.[866]

Heightened conflict characterized this period in Egypt. Domestic unrest in particular threatened the country's stability. Shifting regional alliances also typified Egyptian foreign relations.

b. Nuclear Program

Despite a rather tumultuous period in Egypt's history, Egyptian nuclear capabilities showed little sign of change. Its nuclear program initially came under international scrutiny in 2004 as the IAEA found that it had failed to report nuclear activities between 1990 and 2003.[867] But Egypt fully cooperated with the IAEA

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862 David D. Kirkpatrick, "Army Ousts Egypt's President; Morsi Is Taken Into Military Custody," *New York Times*, July 3, 2013, http://www.nytimes.com/2013/07/04/world/middleeast/egypt.html.

863 Monier and Ranko, "The Fall of the Muslim Brotherhood: Implications for Egypt."

864 Ibid.

865 Oz Hassan, "Undermining the Transatlantic Democracy Agenda? The Arab Spring and Saudi Arabia's Counteracting Democracy Strategy," *Democratization* 22, no. 3 (April 16, 2015): 487, https://doi.org/10.1080/13510347.2014.981161.

866 Spencer Ackerman, "Obama Restores U.S. Military Aid to Egypt over Islamic State Concerns," *The Guardian*, March 31, 2015, https://www.theguardian.com/us-news/2015/mar/31/obama-restores-us-military-aid-to-egypt.

867 "Profile for Egypt," Nuclear Threat Initiative, accessed January 12, 2016, http://www.nti.org/country-profiles/egypt/nuclear/.

investigation. In 2005, the agency judged that Egypt had failed to report the following: 1) an "initial inventory of imported UF4, imported and domestically produced uranium metal, imported thorium compounds, small quantities of domestically produced UO_2, UO_3, and UF_4, and a number of unirradiated low enriched and natural uranium fuel rods"; 2) "uranyl nitrate and scrap UO_2 pellets, and their use for acceptance testing of the Hydrometallurgy Pilot Plant"; 3) "the irradiation of small amounts of natural uranium and thorium and their subsequent dissolution in the Nuclear Chemistry Building laboratories, including the production and transfer of waste"; and 4) "initial design information for the Hydrometallurgy Pilot Plant and the Radioisotope Production Facility, and modified design information for the two reactors."[868] Egypt responded to the IAEA by claiming "a lack of clarity about its obligations under its Safeguards Agreement, particularly as regards small quantities of nuclear material used in research and development activities."[869]

After the investigation, concern regarding Egypt's nuclear program came to an end. Egypt nuclear expert Jim Walsh assessed that Egypt's full cooperation with the investigation indicated that it was not interested in acquiring nuclear weapons.[870] He wrote that "while concealment activities may not be certain evidence of possession, in general, the more cooperative a country is with the IAEA, the greater confidence one should have in its nuclear policy."[871]

Meanwhile, Egypt continued its efforts to put political pressure on Israel during the 2005 Nuclear Nonproliferation Treaty (NPT) Review Conference for its refusal to sign the NPT. Because of Egypt's labors, the conference concluded without a consensus

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868 International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement in the Arab Republic of Egypt." February 14, 2005.

869 Ibid.

870 Jim Walsh, "Will Egypt Seek Nuclear Weapons?," in *Forecasting Nuclear Proliferation in the 21st Century: Volume 2, A Comparative Perspective*, ed. William Potter and Gaukhar Mukhatzhanova (Palo Alto, CA: Stanford Security Studies, 2010), 34.

871 Ibid.

document.[872] At the 2010 NPT Review Conference, Egypt won another victory in regional politics. It was able to negotiate for a conference on a nuclear-weapon-free zone (NWFZ) and include language that Israel disagreed with in the consensus document.[873] Egypt continued to push for a NWFZ in the region through 2013.[874]

Egypt's leadership joined other regional leaders in 2006 in calling for a nuclear power program. President Mubarak's son, Gamal, made the initial proposal in September at a National Democratic Party conference. Gamal stated that "it is time for Egypt to put forth, and the party will put forth, this proposal for discussion about its future energy policies, the issue of alternative energy, including nuclear energy, as one of the alternatives."[875]

Meanwhile, Muslim Brotherhood politicians called for Egypt to acquire a nuclear weapon. Ibrahim Said quoted Muslim Brotherhood politician Hamdi Hassan saying in 2006: "We [Egyptians] are ready to starve in order to own a nuclear weapon that will represent a real deterrent and will be decisive in the Arab-Israeli conflict."[876] The Muslim Brotherhood heavily criticized the Mubarak government's advocacy of a weapons-of-mass-destruction free zone.[877] It was also in disagreement with the Mubarak government's stance against Iran's nuclear program.[878] The group pushed the government to restart Egypt's nuclear weapons program.[879] Finally, Sheikh Yousuf Al-Qaradhawi, an Egyptian based in Qatar who was viewed as a religious leader for the

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872 Maria Rost Rublee, "Leadership Transitions and Nuclear Futures in Egypt and Libya," in *The Nuclear Question in the Middle East*, ed. Mehran Kamrava, First Edition (New York: Oxford University Press, 2012), 66.

873 Ibid.

874 "Profile for Egypt."

875 Michael Slackman and Mona El-Naggar, "Mubarak's Son Proposes Nuclear Program," *New York Times*, September 20, 2006, http://www.nytimes.com/2006/09/20/world/africa/20egypt.html.

876 Ibrahim Said, "The Bomb and the Beard: The Egyptian MB's Views toward WMD," *Arms Control and Regional Security for the Middle East* (blog), June 11, 2012, http://middleeast-armscontrol.com/2012/06/11/the-bomb-and-the-beard-the-egyptian-mbs-views-toward-wmd/.

877 Ibid.

878 Ibid.

879 Ibid.

Muslim Brotherhood supported its position. He advocated in 2009 for the Islamic world to acquire nuclear weapons as a deterrent, but not use them.[880] Overall, the Muslim Brotherhood openly supported the idea of a nuclear deterrent for Egypt.[881]

Egypt sought to move forward through 2013 with plans for nuclear power; it showed no sign of a bid to restart its nuclear weapons program. Notwithstanding earlier calls by the Muslim Brotherhood for a nuclear deterrent, Morsi adhered to a more staid approach to the country's nuclear program when he was in power. To manage its nuclear energy initiative, the Higher Council for Peaceful Use of Nuclear Energy was established in 2007. In 2008, Egypt and Russia signed a nuclear cooperation agreement. In 2009, Egypt contracted with an Australian engineering firm Worley Parsons to conduct site selection for a nuclear power plant and provide training and services.[882] In 2010, the Egyptian government announced its intentions to construct its first nuclear power plant in the city of El-Dabaa.[883] Also in 2010, Egypt contracted with South Korea's Korea International Cooperation Agency to train its nuclear personnel. In 2011, Egypt announced plans to complete four nuclear power plants by 2025. Despite the domestic turbulence in 2013, the Egyptian government moved ahead in October with plans for a nuclear plant in El-Dabaa.[884] In November, Egypt launched a tender to construct the first power station.[885] Egypt continued discussions with Russia regarding assistance for Egypt's nuclear program in April 2013 under Morsi and in November 2013 under the

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880 "Sheikh Yousuf Al-Qaradhawi: The Arabs Should Obtain Nuclear Weapons for Deterrence," (*Qatar TV*, February 20, 2009), published online by Middle East Media Research Institute TV Monitor Project, http://www.memritv.org/clip_transcript/en/2057.htm.

881 Rublee, "Leadership Transitions and Nuclear Futures in Egypt and Libya," 72.

882 "South Korea to Train Egyptian Nuclear Engineers," *World Nuclear News*, January 21, 2010, http://www.world-nuclear-news.org/NN-South_Korea_to_train_Egyptian_nuclear_engineers-2101105.html.

883 "Profile for Egypt—Nuclear."

884 Ayah Aman, "Egypt Moves Ahead with Nuclear Plant to Address Electricity Crisis," Al-Monitor, November 26, 2013, http://www.al-monitor.com/pulse/originals/2013/11/egypt-nuclear-program-energy-uranium.html.

885 Reuters, "Egypt to Seek Bids for First Nuclear Plant," *Egypt Independent*, November 14, 2013, http://www.egyptindependent.com/news/egypt-seek-bids-first-nuclear-plant.

interim government.[886] Finally, in late 2013, Egypt sought bids to create the regulatory framework for its nuclear program and received bids from companies in Canada, France, Germany, South Korea, the United Kingdom, and the United States.[887]

While Egypt pursued nuclear power capabilities, it did not appear to increase its offensive ballistic missile capabilities.[888] Rather, Egypt focused on missile defense. For example, the U.S. Military's Defense Security Cooperation Agency reported to the U.S. Congress in 2009 that Egypt had requested 20 Harpoon Block II Anti-Ship Cruise Missiles and 4 Shipboard Command Launch Control Systems.[889]

c. Nuclear Trends

Egypt's nuclear capabilities did not significantly change between 2004 and 2013. It continued to maintain a civilian nuclear program with a developed nuclear infrastructure, which included "a well-established administrative infrastructure and multiple nuclear facilities spread over several locations, including two research reactors and exploratory uranium-mining operations"[890] Egypt pursued nuclear power beginning in 2006. The country made a renewed push for nuclear power in 2010. But, the country was far from breaking ground on a nuclear power plant as of late 2013. Egypt did not move forward with the acquisition of fissile material, a nuclear warhead, or a delivery vehicle.

What drove Egypt's nuclear behavior? Looking at the regional context, conflict and rivalry persisted. By the end of the period, Egypt along with other regional states were immersed in the aftermath of the Arab Uprising. Egypt's regional alliances had shifted back and forth. Nevertheless, nuclear proliferation did not increase. This was the

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886 Ibid.

887 "South Korea to Train Egyptian Nuclear Engineers."

888 "Profile for Egypt—Missile."

889 "Egypt – Harpoon Block II Anti-Ship Cruise Missiles" (Washington, DC: Defense Security Cooperation Agency, U.S. Military, December 8, 2009), http://www.dsca.mil/major-arms-sales/egypt-harpoon-block-ii-anti-ship-cruise-missiles.

890 International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran*, 24.

case regardless of the party in power even though the Muslim Brotherhood embraced the idea that Egypt should acquire a nuclear deterrent. This outcome is counterintuitive. It would seem that given the challenges Egypt faced, it would have been more motivated to pursue a nuclear deterrent. While Egypt's nuclear decision-making may have been influenced by its historic alliance with the United States, this relationship became rocky in 2011 over the perceived mistreatment of Mubarak. This nuclear restraint might serve as an example of the growing influence of the nonproliferation regime. Egypt was careful to demonstrate that it had nothing to hide from the IAEA in the early 2000s and it continued to be active in the NPT negotiations.

2. Iran

Conflict in Iran's immediate neighborhood continued during this time period. The United States maintained a troop presence in Afghanistan through 2013 and Iraq until 2011. In the Arab Uprising, Iran took sides backing Shia opposition groups and fighting to help its close ally, Bashar al-Assad stay in power in Syria. On the nuclear front, Iran pushed to advances its nuclear and missile capabilities wherever possible. While Iran had scaled back the military component of its nuclear program in 2003, the country pursued a balance between advancing the development of its nuclear program and seeking to avoid additional sanctions or a more forceful military response.

a. Political Context

Following the Second Gulf War, Iran ramped-up its asymmetric warfare efforts in the region. As in previous decades, the country utilized its asymmetric warfare capabilities to execute its foreign policy. Iran focused on confronting the United States – its greatest strategic threat – in neighboring countries Afghanistan and Iraq. It did not take long after the U.S.-led invasion of Iraq in 2003 for Iran to channel its available resources to counteract U.S. goals in Iraq. Iran's objective, after decades of rivalry with its neighbor, was to ensure that whatever regime replaced Saddam Hussein was friendly

to Iran. The U.S. intelligence community assessed in early 2005 that Iran desired to both hinder U.S. efforts and to install a Shia-controlled government in Iraq.[891]

In order to challenge the U.S. military, Iran employed the Islamic Revolutionary Guard Corps' Qods Force, the security forces charged with conducting irregular warfare outside of Iran. Iran's efforts included support to the Taliban in Afghanistan and Shia insurgents in Iraq in the form of weapons and training. Alireza Nader and Joya Laha explained that the United States "accused the Qods Force of providing Iraqi Shia insurgents with sophisticated explosively formed penetrators (EFPs), a highly lethal type of improvised explosive device, used against U.S. and coalition forces" and that "similar EFPs, along with other Iranian weapons, could have found their way into Taliban hands."[892] These weapons were more lethal than the insurgent elements would have used on their own. Iran began sponsoring Shia insurgents in Iraq, such as the Badr Organization, against U.S. and coalition forces. Basel Salloukh surmised that Iran's successes in Iraq allowed it to alter the regional balance of power in its favor.[893]

Second, tension mounted between Israel and Iran. In 2012, several attacks or planned attacks against Israeli diplomats or their families were attributed to Iran. An attack placing a magnetic bomb on a diplomatic vehicle was carried out in New Delhi resulting in injury to an Israeli diplomat's wife and three Indian nationals.[894] In addition, attacks were attempted or planned in Tbilisi, Georgia; Bangkok, Thailand; and Kenya.[895] The U.S. State Department noted that press reporting indicated the Qods Force was responsible for these operations.[896]

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891 Director of National Intelligence, "Annual Threat Assessment of the Director of National Intelligence for the Senate Select Committee on Intelligence, 2006," February 2, 2006, 12, https://www.dni.gov/files/documents/Newsroom/Testimonies/20060202_testimony.pdf.

892 Alireza Nader and Joya Laha, "Iran's Balancing Act in Afghanistan" (RAND Corporation, 2011), 10, http://www.rand.org/pubs/occasional_papers/OP322.html.

893 Bassel F. Salloukh, "The Arab Uprisings and the Geopolitics of the Middle East," *The International Spectator* 48, no. 2 (June 1, 2013): 34, https://doi.org/10.1080/03932729.2013.787830.

894 U.S. Department of State, "Country Reports on Terrorism 2012: Chapter 3: State Sponsors of Terrorism Overview" (May 30, 2013), http://www.state.gov/j/ct/rls/crt/2012/209985.htm.

895 Ibid.

896 Ibid.

Third, rivalry and conflict characterized the relationship between Iran and Saudi Arabia. In 2011, the United States discovered a daring Qods Force plot that involved tasking Iranian-American Mansour Arbabsiar to hire a drug cartel member to assassinate the Saudi ambassador to the United States.[897] The Iranian-American implicated in the plot confessed that he was acting on behalf of the Qods Force.[898] The U.S. intelligence community assessed that the plot demonstrated that "some Iranian officials—probably including Supreme Leader Ali Khamenei—have changed their calculus and are now more willing to conduct an attack in the United States in response to real or perceived U.S. actions that threaten the regime."[899] Iran and the Gulf States found themselves on opposite sides throughout the Arab Uprisings. By 2012, Iran was aiding the Houthis in Yemen in their rebellion against the central government.[900] In this conflict, Saudi Arabia and, sometimes, other Arab states supported the Yemeni government. In mid-2012, Iran was quick to support newly elected President Morsi, affiliated with Egypt's Muslim Brotherhood, while Saudi Arabia supported the Mubarak and Sisi governments.

Fourth, the year 2011 brought a serious threat to Iran's operating base in the Levant as Arab Uprising protests erupted in Syria. Iran's loss of access to Damascus would have signified a significant setback in the Levant, particularly Iran's ability to threaten Israel. And Iran had signed a defense agreement with Syria in 2006. According to the U.S. State Department, "Iran provided extensive support, including weapons, funds, and training to assist the Assad regime."[901]

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897 Benjamin Weiser, "Mansour Arbabsiar Sentenced for Plot to Kill Saudi Ambassador," *New York Times*, May 30, 2013, http://www.nytimes.com/2013/05/31/nyregion/mansour-arbabsiar-sentenced-for-plot-to-kill-saudi-ambassador.html.

898 Ibid.

899 Director of National Intelligence, "Unclassified Statement for the Record on the Worldwide Threat Assessment of the U.S. Intelligence Community for the Senate Select Committee on Intelligence, 2012," January 31, 2012, 5, https://www.dni.gov/files/documents/Newsroom/Testimonies/20120131_testimony_ata.pdf.

900 Eric Schmitt and Robert F. Worth, "Aiding Yemen Rebels, Iran Seeks Wider Mideast Role," *New York Times*, March 15, 2012, http://www.nytimes.com/2012/03/15/world/middleeast/aiding-yemen-rebels-iran-seeks-wider-mideast-role.html.

901 U.S. Department of State, "Country Reports on Terrorism 2012: Chapter 3: State Sponsors of Terrorism Overview."

Drawing on its long-standing ties in the Levant, Iran was able to project significant force. The U.S. State Department reported that "Iran viewed Syria as a crucial causeway in its weapons supply route to Lebanese Hezbollah" and described Iran's operations in Syria as follows:

> Iran publicly admits to sending members of the IRGC to Syria in an advisory role. There is consistent media reporting that some of the troops are IRGC-QF members and that they have taken part in direct combat operations. While Tehran had denied that IRGC-QF personnel participate in combat operations, in 2014 it acknowledged the deaths in Syria of two senior officers (Brigadier Generals Abdullah Eskandari and Jamar Dariswali). Tehran claimed they were volunteers who lost their lives while protecting holy shrines near Damascus.[902]

Further, Russia demonstrated its ability to serve as a strategic ally to Iran. Russia did not join the United States and other European states in condemning the Assad regime. This allowed Iran to continue with its efforts in Syria.

In terms of other regional states, Iran and its neighbor Turkey generally maintained friendly relations. The two countries increased economic ties, focusing on natural gas and tourism. Plans were laid for a pipeline between Iran and Turkey. They also cooperated in combatting cross-border drug trafficking. Iran's relationship with Turkey became substantially more difficult in 2011 as conflict broke out in Syria. Turkey supported the opposition forces seeking to oust the Assad regime from power. Among the Gulf States, Iran and Oman extended their economic ties as the two countries agreed to jointly develop the Kish cross-border gas field in 2008. Also, Kuwait received its first visit in 27 years from Iran in 2006.

On the domestic front, Iran experienced significant turmoil during this time period. In June 2009, a protest movement, referred to as the "Green Movement," emerged after the 2009 presidential election. Reformist presidential candidates Mir Hossain Musavi and Mehdi Karrubi lost the election to hardliner Mahmud Ahmadinenjad, the incumbent. Both Musavi and Karrubi alleged that the elections were fraudulent. Protests

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902 U.S. Department of State, "Country Reports on Terrorism 2014: Chapter 3: State Sponsors of Terrorism Overview" (April 2015), https://www.state.gov/j/ct/rls/crt/2014/239410.htm.

against the election results occurred across Iran until the Iranian government retaliated. And the Iranian government was able to quell the uprising. Musavi and Karrubi then became leaders of an opposition movement that demanded more rights and greater democracy in Iran.

At the next presidential election, Iranians voted a more moderate president, Hassan Ruhani, into power. He campaigned on a platform of improving both the economy and relations with the West. With the election of Ruhani, Iran was more open to a rapprochement with the West. In September 2013, Obama and Ruhani spoke on the phone. It was the first time that this had happened between U.S. and Iranian presidents since the 1979 Iranian Revolution.

Overall, Iran saw its regional political power increase from 2004 to 2013. Iraq no longer posed a threat. And Iran increased support to Shia populations across the region. It was the Gulf States, led by Saudi Arabia, which stood as a counterweight to Iran. Of course, the great powers were not shy about confronting Iran either.

b. Nuclear Program

While Iran remained embroiled in regional conflicts, Germany, the United Kingdom, and France, also known as the EU-3, focused on uncovering Iran's nuclear development activities after the revelations in 2002 and 2003 regarding Iran's program. The three European countries wished to demonstrate a multilateral approach to this nuclear challenge and took the lead in negotiations with Iran until 2005.[903] In early 2004, the IAEA sought to acquire a complete picture as to Iran's nuclear activities. For example, in January, it discovered that Iran had a P-2 centrifuge design rather than just knowledge of the P-1 centrifuge.[904] The IAEA's work led the agency to assess in November that Iran had made "substantial efforts over the past two decades to master an

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[903] David Santoro, "European and P5 Responses to Iran's Nuclear Program," in *International Cooperation on WMD Nonproliferation*, ed. Jeffrey Knopf (Athens, GA: University of Georgia Press, 2016), 272.

[904] International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran," February 24, 2004, 8, https://www.iaea.org/sites/default/files/gov2004-11.pdf.

independent nuclear fuel cycle."[905] It was becoming evident that Iran had sought to exploit a loophole in the NPT, as described by Wade Huntley, pursuit of fissile material production capabilities under the guise of peaceful applications.[906] Under continued pressure, Iran agreed with Germany, the United Kingdom, and France in the November 2004 Paris Agreement to suspend nuclear enrichment and conversion activities. The three European states had taken the first steps to find a diplomatic solution to the Iran nuclear crisis.

In 2005, the United States joined Germany, the United Kingdom, France, and the IAEA in their efforts to resolve concerns regarding Iran's nuclear program. The European states persisted in their efforts to find a diplomatic solution. Nevertheless, Iran ultimately rejected their proposal in August and then indicated it would begin enriching uranium once again. Iran carried out uranium conversion at its Uranium Conversion Facility beginning in August 2005 and continued construction of the Iran Nuclear Research Reactor (IR-40) at Arak.[907] Furthermore, the IAEA made worrying discoveries regarding a Green Salt Project, which had involved "the conversion of uranium dioxide into UF_4 (often referred to as green salt), as well as tests related to high explosives and the design of a missile re-entry vehicle, all of which could involve nuclear material."[908] The United States took unilateral steps against Iran by mid-2005. On June 29, 2005, Executive Order 13382, signed by President George W. Bush, went into effect. It froze the assets of entities supporting proliferation.[909] For Iran, the executive order named the Aerospace Industries Organization, the Shahid Hemmat Industrial Group, the Shahid Bakeri

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[905] International Atomic Energy Agency, Board of Governors, Director General, "IAEA Board Report: Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran," November 15, 2004, 23, https://www.iaea.org/sites/default/files/gov2004-83.pdf.

[906] Huntley, "Rebels without a Cause," 733.

[907] International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran," November 18, 2005, 4, https://www.iaea.org/sites/default/files/gov2005-87.pdf.

[908] International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran," February 27, 2006, 8, https://www.iaea.org/sites/default/files/gov2006-15.pdf.

[909] U.S. Department of State, Bureau of Public Affairs, "Executive Order 13382," April 16, 2007, http://www.state.gov/t/isn/c22080.htm.

Industrial Group, and the Atomic Energy Organization of Iran.[910] Iran was not referred to the United Nations (UN) Security Council, however, as Germany, the United Kingdom, France, and the United States waited for Russia and China to convince Iran to halt its proliferation efforts.[911]

In 2006, Iran grew less cooperative. Until early 2006, Iran had complied with its agreement to submit reports and provide information to the IAEA.[912] In January, however, Iran restarted its centrifuge enrichment efforts at the Pilot Fuel Enrichment Plant at Natanz, ending its voluntary adherence to the Additional Protocol.[913] The IAEA monitored both the enrichment at the Pilot Fuel Enrichment Plant and the conversion at the Uranium Conversion Facility.[914] In April 2006, Iranian President Mahmud Ahmadinejad surprised the international community when he asserted that Iran was carrying out research on the P-2 centrifuge, which would result in a four-fold increase in the centrifuge's capabilities.[915] Iran also advised it had successfully enriched uranium.

In response, great powers came together to dissuade Iran from continuing its nuclear efforts. The United States, Russia, and China joined Germany, the United Kingdom, and France to make another proposal. In the proposal, they offered light water reactors along with nuclear fuel and cooperation in the arenas of technology,

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910 "Executive Order 13382—Blocking Property of Weapons of Mass Destruction Proliferators and Their Supporters" (Washington, DC, July 1, 2005), http://www.state.gov/documents/organization/135435.pdf.

911 Steven R. Weisman, "U.S. and Europe Put off Referral of Iran Case to Security Council," *New York Times*, November 23, 2005, http://www.nytimes.com/2005/11/23/world/middleeast/us-and-europe-put-off-referral-of-iran-case-to-security.html.

912 International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement and Relevant Provisions of Security Council Resolutions in the Islamic Republic of Iran," November 8, 2011, Annex, 2.

913 Director of National Intelligence, "Annual Threat Assessment of the Intelligence Community for the House Permanent Select Committee on Intelligence, 2008," 13.

914 International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran," February 27, 2006, 7.

915 William J. Broad and David E. Sanger, "Iran Claims Nuclear Steps in New Worry," *New York Times*, April 17, 2006, http://www.nytimes.com/2006/04/17/world/middleeast/17nuke.html.

telecommunications, agriculture, and civil aviation.[916] Iran rejected this proposal and then Ahmadinejad held a ceremony to officially open the Arak heavy water plant in August.[917] In turn, the UN Security Council passed resolution 1696 in July and resolution 1737 in December. The former called for an end to uranium enrichment and served as the first legally binding action against the state; the latter put sanctions in place against businesses and individual people affiliated with Iran's nuclear and missile programs.[918] Resolution 1737 also forbade transfer to Iran of nuclear and missile technology.[919] Iran continued enriching uranium and developing its nuclear program. While the great powers came together to take action in the UN Security Council, Russia and China stopped short of supporting sanctions.

In 2007, Iran worked to advance its development of nuclear fuel. Iran worked to install centrifuge cascades at the Fuel Enrichment Plant at Natanz and feed UF_6 into the cascades.[920] It also tested centrifuge machines at the Pilot Fuel Enrichment Plant.[921] The U.S. intelligence community observed that while Iran had made progress by installing the centrifuges, it had encountered many technical challenges in getting them to function.[922] Also, Iran continued uranium conversion at the Uranium Conversion Facility, construction of the IR-40 facility, and operation of its Heavy Water Production Plant.[923]

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916 "History of Official Proposals on the Iranian Nuclear Issue," Arms Control Association, July 2015, https://www.armscontrol.org/factsheets/Iran_Nuclear_Proposals.

917 Ali Akbar Dareini, "Iran Reasserts Nuclear Rights as Deadline from UN Nears," *Washington Post*, August 27, 2006, http://www.washingtonpost.com/wp-dyn/content/article/2006/08/26/AR2006082600674.html.

918 "History of Official Proposals on the Iranian Nuclear Issue."

919 Ibid.

920 International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement and Relevant Provisions of Security Council Resolutions 1737 (2006) and 1747 (2007) in the Islamic Republic of Iran," November 15, 2007, 6, https://www.iaea.org/sites/default/files/gov2007-58.pdf.

921 Ibid.

922 Director of National Intelligence, "Annual Threat Assessment of the Intelligence Community for the House Permanent Select Committee on Intelligence, 2008," 13.

923 International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement and Relevant Provisions of Security Council Resolutions 1737 (2006) and 1747 (2007) in the Islamic Republic of Iran," November 15, 2007, 7.

Iran found itself confronted by the UN Security Council, by the P5+1, and the United States, in a unilateral capacity. The UN Security Council approved resolutions 1747 in March 2007, 1803 in March 2008, and 1835 in September 2008. The first two resolutions augmented proliferation-related sanctions against both people and organizations associated with Iran's nuclear program and missile program.[924] The third resolution underscored the demands of the first two.[925] Furthermore, in June 2008, the P5+1 introduced another proposal to Iran. Of note, it added research and development for nuclear energy, nuclear energy assistance, and treating Iran's nuclear program like those of other non-nuclear-weapons states.[926] An agreement could not be reached, however. In October 2007, the United States put unilateral sanctions in place on three Iranian banks and companies associated with the Islamic Revolutionary Guard Corps.

Meanwhile, the IAEA continued its efforts to clarify questions regarding Iran's nuclear program and acknowledged Iran's lack of cooperation. For example, the IAEA wrote in 2008 that Iran's response focused on "deficiencies in form and format," rather than the substance of the issue.[927] The IAEA noted that between 2007 and 2010, Iran was not advising about construction decisions in a prompt manner to include plans regarding the Fordow Fuel Enrichment Plant and a new nuclear power plant at Darkhovin.[928]

Iran persisted in its pattern of being less than forthcoming in regards to nuclear developments. In September 2009, Iran rushed to announce a second pilot enrichment facility, the Fordow Fuel Enrichment Plant near Qom, before a public revelation of the facility by the leaders of the United States, the United Kingdom, and France including the fact that the Fordow Fuel Enrichment Plant was located on an Islamic Revolutionary

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924 "History of Official Proposals on the Iranian Nuclear Issue."

925 Ibid.

926 Ibid.

927 International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement and Relevant Provisions of Security Council Resolutions 1737 (2006), 1747 (2007) and 1803 (2008) in the Islamic Republic of Iran," September 15, 2008, 4, https://www.iaea.org/sites/default/files/gov2008-38.pdf.

928 International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement and Relevant Provisions of Security Council Resolutions in the Islamic Republic of Iran," November 8, 2011, Annex, 3.

Guard Corps base.[929] The IAEA assessed that construction had occurred between 2002 and 2004 and it had restarted in 2006 along with work on nuclear weapons design.[930] The IAEA confirmed in late October 2009 that the Fordow Fuel Enrichment Plant could hold about 3,000 IR-1 centrifuges, based on Pakistan's P-1 centrifuge design, but it could also use centrifuges that are more advanced.[931] Furthermore, the IAEA Board of Governors reported in December 2015 that Iran had conducted research about a nuclear explosive device through computer modeling before 2004 and between 2005 and 2009.[932]

In October 2009, the P5+1 offered to facilitate a fuel swap for the U.S.-supplied Tehran Research Reactor as Iran anticipated it would require more fuel. In their proposal, Russia would help enrich the needed low enriched uranium and France would manufacture the fuel rods while the United States and the IAEA would assist with improving the Tehran Research Reactor's operational and safety functions.[933] The P5+1 also offered financing for the fuel swap.[934] While Iran initially accepted this offer, it was later rejected due to domestic opposition and Iran's counterproposal was not acceptable to the P5+1.[935] In November 2009, under pressure to cease work on the Fordow Fuel Enrichment Plant, Iran announced that it would build ten more such plants and it would examine how to enrich its own fuel for the Tehran Research Reactor.[936]

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929 International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement and Relevant Provisions of Security Council Resolutions 1737 (2006), 1747 (2007), 1803 (2008) and 1835 (2008) in the Islamic Republic of Iran," November 16, 2009, 2, https://www.iaea.org/sites/default/files/gov2009-74.pdf.

930 Ibid., 3–4.

931 Ibid., 3.

932 International Atomic Energy Agency, Board of Governors, Director General, "Final Assessment on Past and Present Outstanding Issues Regarding Iran's Nuclear Program," 14.

933 "History of Official Proposals on the Iranian Nuclear Issue."

934 Ibid.

935 "Profile for Iran—Nuclear."

936 David E. Sanger and William J. Broad, "A Defiant Iran Vows to Build Nuclear Plants," *New York Times*, November 29, 2009, http://www.nytimes.com/2009/11/30/world/middleeast/30iran.html.

Seeking to apply greater pressure to Iran, the U.S. Treasury imposed additional sanctions focused on the Iranian banking system and Islamic Revolutionary Guard Corps-affiliated companies in October 2009 and February 2010. On July 1, 2010, the U.S. Congress passed the Comprehensive Iran Sanctions, Accountability, and Divestment Act, which expanded the 1996 Iran Sanctions Act and particularly targeted the petroleum sector in Iran. This U.S. effort was hampered to some extent by Europe, however, as "the existence of numerous deals between European firms and Iran constrained many of the harsher U.S. measures that required sanctions against foreign firms dealing with Iran."[937]

Concerns regarding Iran's nuclear activities persisted. According to the Arms Control Association, Iran started enriching uranium up to 20 percent in February 2010, allegedly for the Tehran Research Reactor; however, Turkey and Brazil brokered a fuel exchange for the Tehran Research Reactor known as the Tehran Declaration in May 2010.[938] The Arms Control Association noted, in the agreement, Turkey would serve as an intermediary for Iran's fuel.[939] The association's summary continued by stating, while Iran agreed to this arrangement, France, Russia, and the United States did not agree as it did not address Iran's enrichment activities, specifically continued uranium enrichment at the 20 percent level and acquisition of low enriched uranium.[940] Kayhan Barzegar assessed that this agreement occurred as Turkey sought to replace the EU as an intermediary.[941] After the Turkey-Brazil agreement, the United States won a crucial diplomatic victory when Russia and China agreed finally to support sanctions against Iran in May 2010, paving the way for coordinated movement in the UN Security Council.[942] Why did Russia and China finally agree to sanctions? History seemed to indicate they

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937 "Economic Sanctions: Pressuring Iran's Nuclear Program," Nuclear Threat Initiative, accessed November 1, 2016, http://www.nti.org/analysis/articles/pressuring-irans-nuclear-program/.

938 "History of Official Proposals on the Iranian Nuclear Issue."

939 Ibid.

940 Ibid.

941 Kayhan Barzegar, "Iran's Nuclear Program," in *Nuclear Question in the Middle East*, ed. Mehran Kamrava, First Edition (New York: Oxford University Press, 2012), 261.

942 Max Fisher, "Why Russia and China Joined on Iran Sanctions," *Atlantic*, May 18, 2010, http://www.theatlantic.com/international/archive/2010/05/why-russia-and-china-joined-on-iran-sanctions/56905/.

were motivated out of self-interest. Max Fisher suggested that Russia agreed out of concern for a nuclear arms race in the Middle East, which would not be in Russia's security interests.[943] He added that Russia may have also seen economic benefits from sanctions against a competitor in the natural gas market and Russia may have wanted to be viewed as more cooperative on the world stage as well.[944] Kayhan Barzegar wrote that Russia was playing a balancing act with the Iran issue. On one hand, Russia was interested in nuclear-related contracts for economic reasons.[945] On the other hand, Russia viewed Iran's nuclear program as a threat and wished to contain it.[946] Fisher wrote that China might have succumbed to U.S. pressure rather than face U.S. action on China's currency manipulation.[947] Russian and Chinese officials indicated that they appreciated that the sanctions focused on nonproliferation and bringing Iran to negotiations.[948] At its heart, Russia and China acknowledged with this agreement that pressure on Iran had to be strong enough to bring it to the negotiating table.

In June 2010, the Security Council passed Resolution 1929 that expanded sanctions targeting the financial dealings of individuals and organizations associated with Iran's nuclear program and missile program.[949] The P5+1 and Iran held discussions in December 2010 and January 2011. They quickly came to a halt, however, after Iran insisted on an end to economic sanctions prior to the beginning of serious nuclear negotiations.

Since 2006, Iran had increased its enrichment capabilities. In early 2011, U.S. intelligence reported that Iran had installed close to 5,000 centrifuges and produced over

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943 Ibid.

944 Ibid.

945 Barzegar, "Iran's Nuclear Program," 258–59.

946 Ibid., 258.

947 Fisher, "Why Russia and China Joined on Iran Sanctions."

948 David E. Sanger and Mark Landler, "Major Powers Have Deal on Sanctions for Iran," *New York Times*, May 18, 2010, http://www.nytimes.com/2010/05/19/world/19sanctions.html.

949 Ibid.

3,000 kg of low enriched uranium.[950] The IAEA reported in November 2011 that, since 2007, Iran had produced 4922 kg of low enriched uranium hexafluoride.[951] Furthermore, Iran had produced nearly 80 kg of uranium hexafluoride enriched up to 20 percent uranium-235, reportedly to be used by the Tehran Research Reactor from about 766 kg of the low enriched uranium hexafluoride.[952] It also continued to construct the Fordow Fuel Enrichment Plant.

New reports provided worrying assessments regarding Iran's nuclear program. The U.S. intelligence community assessed in early 2011 that Iran had "the scientific, technical, and industrial capacity to eventually produce nuclear weapons, making the central issue its political will to do so."[953] The IAEA's November 2011 report included an annex with long-awaited information on the possible military scope of Iran's nuclear program, which covered the period from late 2002 to November 2011. The report found multiple areas where Iran's efforts since the late 1980s were consistent with developing a nuclear weapon.[954] The U.S. intelligence community also judged that Iran was taking a cost-benefit approach to its pursuit of nuclear weapons.[955] This provided hope that if the cost of Iran's pursuit of developing its nuclear program were high enough, Iran would undertake serious nuclear negotiations with the P5+1. The members of the P5+1 would have to come together in order to increase the political and economic costs for Iran's continued development of its nuclear program.

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950 Director of National Intelligence, "Statement for the Record on the Worldwide Threat Assessment of the U.S. Intelligence Community for the Senate Select Committee on Intelligence, 2011," February 16, 2011, 4, https://www.dni.gov/files/documents/Newsroom/Testimonies/20110216_testimony_sfr.pdf.

951 International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement and Relevant Provisions of Security Council Resolutions in the Islamic Republic of Iran," 3.

952 Ibid., 4.

953 Director of National Intelligence, "Statement for the Record on the Worldwide Threat Assessment of the U.S. Intelligence Community for the Senate Select Committee on Intelligence, 2011," 4.

954 International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement and Relevant Provisions of Security Council Resolutions in the Islamic Republic of Iran," November 8, 2011, 65.

955 Director of National Intelligence, "Statement for the Record on the Worldwide Threat Assessment of the U.S. Intelligence Community for the Senate Select Committee on Intelligence, 2011," 5.

Russia and China acted separately from the United States, Germany, the United Kingdom, and France in 2011. In July, Russia put forward a proposal to the P5+1 to end the Iranian nuclear crisis. The United States and Europe dismissed the proposal, however, as they believed it lifted sanctions too early in the negotiation process. After the November IAEA report came out, the United States, Germany, the United Kingdom, and France implemented additional sanctions against Iran unilaterally as Russia and China would not agree to new UN Security Council sanctions.[956]

In 2012, the tide began to turn against Iran's continued evasion of accountability. In early January 2012, Iran began uranium enrichment at its Qom facility.[957] And the international community turned to focus on the Parchin Military Complex. In early 2012, the IAEA requested access to the complex, but Iran withheld access. Meanwhile, the Institute for Science and International Security flagged commercially available imagery indicating that Iran was conducting "clean-up, demolition, and reconstruction activities" at the complex.[958] The combined refusal of access and suspected site cover-up was deeply troubling to both the IAEA and P5+1 members.

Throughout 2012, however, it became apparent that the weight of combined sanctions against Iran was having a real affect.[959] The U.S. intelligence community noted:

> Iran's economy contracted in 2012 for the first time in more than two decades. Iran's access to foreign exchange reserves held overseas has diminished, and preliminary data suggest that it suffered its first trade deficit in 14 years. Meanwhile, the rial reached an all-time low in late January, with the exchange rate falling from about 15,000 rials per dollar

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956 "Profile for Iran—Nuclear."

957 Director of National Intelligence, "Unclassified Statement for the Record on the Worldwide Threat Assessment of the U.S. Intelligence Community for the Senate Select Committee on Intelligence, 2012," 5.

958 David Albright, Serena Kelleher-Vergantini, and Christopher Coughlin, "Modifications at the Parchin Site: A Comprehensive Timeline; New Imagery Suggests Re-Asphalting" (Washington, DC: Institute for Science and International Security, February 11, 2015), 3, http://isis-online.org/uploads/isis-reports/documents/Parchin_February_11_2015_Final.pdf.

959 Patrick Clawson, "The Iran Primer: U.S. Sanctions" (Washington, DC: U.S. Institute of Peace, August 2015), http://iranprimer.usip.org/resource/us-sanctions.

at the beginning of 2012 to nearly 40,000 rials per dollar, and inflation and unemployment are growing.[960]

According to the U.S. intelligence community, Iran's conundrum came down to the question of how to avoid military or economic punishment while striving to improve nuclear and missile capabilities.[961]

With Iran's economic challenges as a backdrop, negotiations between the P5+1 and Iran gained new momentum in 2012. The two sides met in April, May, and June, and by June, they had agreed on expert-level talks.[962] The negotiations then stalled in July and the United States expanded sanctions once again against Iran in August through the Iran Threat Reduction and Syria Human Rights Act.[963] The European Union followed the U.S. lead and intensified its sanctions against Iran as well.

Secret bilateral talks between the United States and Iran regarding Iran's nuclear program occurred in March 2013.[964] Then discussions ensued between the P5+1 in April 2013. These negotiations paused as the new Ruhani administration came to power in June. In order to maintain the pressure against Iran, President Obama expanded sanctions once again through an executive order signed in June. The United States recognized that Iran continued to advance its nuclear program. The U.S. intelligence community judged that during 2013, Iran stockpiled low enriched uranium hexafluoride, put in place more

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960 Director of National Intelligence, "Statement for the Record, Worldwide Threat Assessment of the U.S. Intelligence Community for the Senate Select Committee on Intelligence, 2013," March 12, 2013, 15, https://www.dni.gov/files/documents/Intelligence%20Reports/2013%20ATA%20SFR%20for%20SSCI%2012%20Mar%202013.pdf.

961 Ibid., 5.

962 "History of Official Proposals on the Iranian Nuclear Issue."

963 U.S. Department of State, Bureau of Public Affairs, "Iran Sanctions Contained in the Iran Threat Reduction and Syria Human Rights Act," (September 28, 2012), http://www.state.gov/e/eb/rls/fs/2012/198393.htm.

964 Laura Rozen, "Inside the Secret U.S.-Iran Diplomacy That Sealed Nuke Deal," *Al-Monitor*, August 11, 2015, http://www.al-monitor.com/pulse/originals/2015/08/iran-us-nuclear-khamenei-salehi-jcpoa-diplomacy.html.

centrifuges in the Fordow Fuel Enrichment Plant, worked on advanced centrifuge designs, and continued to build the IR-40 Heavy Water Research Reactor.[965]

Following the election, U.S.-educated Iranian Foreign Minister Javad Zarif led the Iranian negotiating team. After three rounds of talks in October and November 2013, the two sides signed the Joint Plan of Action. The Joint Plan of Action set the stage for a far-reaching agreement for the Iranian nuclear crisis that would involve Iran limiting its nuclear program in exchange for sanctions relief.[966] The U.S. intelligence community subsequently assessed that the Joint Plan would "temporarily halt the expansion of its enrichment program, eliminate its production and stockpile of 20-percent enriched uranium in a form suitable for further enrichment, and provide additional transparency into its existing and planned nuclear facilities."[967] Chief U.S. nuclear negotiator Wendy Sherman acknowledged that "collaboration on sanctions" brought Iran to the table for negotiations.[968]

In addition to developing its nuclear program from 2004 to 2013, Iran aggressively sought to build its missile program. U.S.-led sanctions against Iran during this period often targeted the missile program along with the nuclear program. The U.S. intelligence community noted that Iran saw its ballistic missile arsenal as a means to deter threats from regional states or the United States and to strike back if attacked.[969]

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965 Director of National Intelligence, "Statement for the Record, Worldwide Threat Assessment of the U.S. Intelligence Community for the Senate Select Committee on Intelligence, 2014," January 29, 2014, 6, https://www.dni.gov/files/documents/Intelligence%20Reports/2014%20WWTA%20%20SFR_SSCI_29_Jan.pdf.

966 "History of Official Proposals on the Iranian Nuclear Issue."

967 Director of National Intelligence, "Statement for the Record, Worldwide Threat Assessment of the U.S. Intelligence Community for the Senate Select Committee on Intelligence, 2014," 6.

968 *Assessing the P5+1 Joint Plan of Action with Iran: Administration Perspectives*, Before the Senate Committee on Banking, Housing and Urban Affairs, 113th Congress (December 12, 2013) (testimony by Wendy R. Sherman, Under Secretary for Political Affairs), https://2009-2017.state.gov/p/us/rm/2013/218639.htm.

969 Director of National Intelligence, "Annual Threat Assessment of the Director of National Intelligence, 2007," January 11, 2007, 7, https://www.dni.gov/files/documents/Newsroom/Testimonies/20070111_testimony.pdf.

This period saw continued development of Iran's missile and space programs. Iran tested a new medium-range ballistic missile in 2004, a modified Shahab-3 named the Ghadr-1 missile, with a range of 1,600 km, according to Michael Elleman.[970] In early 2008, Washington assessed that Iran continued to further develop ballistic missiles that could reach as far as Europe and North Africa.[971] Peter Crail reported that Iran attempted its first satellite launch in August of that year.[972] Furthermore, Elleman added that Iran test-fired the Sajjil, a medium-range ballistic missile with a range of 2,000 km, in 2008, and a modified version of the Sajjil, the Sajjil-2, in 2009.[973]

Iran improved its satellite launch capability. In February 2009, Iran launched its first satellite into space using the Safir-2, according to Crail.[974] He noted that Iran had attempted such a launch unsuccessfully in August 2008.[975] Crail further reported that, in 2011, Iran launched another satellite into space using the Safir-1B and concerns were raised that the satellite launch violated UN Security Council resolution 1929.[976] Furthermore, the U.S. intelligence community noted in early 2011 that Iran's ballistic missiles were "inherently capable of delivering WMD, and if so armed, would fit into the same strategy" of projecting regional power and ensuring self-defense.[977]

The United States also closely monitored Iran's space program given the implications for ballistic missile capabilities. The U.S. intelligence community highlighted to congress that, in 2010, Iran exhibited a new design for the rocket engine of a space launch vehicle, the Simorgh—technology that could transfer to an

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970 Michael Elleman, "The Iran Primer: Iran's Ballistic Missile Program" (Washington, DC: U.S. Institute of Peace, August 2015), http://iranprimer.usip.org/sites/default/files/Nuclear_Elleman_Ballistic%20Missiles.pdf.

971 Director of National Intelligence, "Annual Threat Assessment of the Intelligence Community for the House Permanent Select Committee on Intelligence, 2008," 11.

972 Peter Crail, "Iran Launches Second Satellite," *Arms Control Today*, 41, no. 6 (July 2011): 26–27.

973 Elleman, "The Iran Primer: Iran's Ballistic Missile Program."

974 Crail, "Iran Launches Second Satellite."

975 Ibid.

976 Ibid.

977 Director of National Intelligence, "Statement for the Record on the Worldwide Threat Assessment of the U.S. Intelligence Community for the Senate Select Committee on Intelligence, 2011," 5.

intercontinental ballistic missile.[978] In January 2013, Iran claimed to have sent a monkey up into space and that it had survived. There were some questions, however, regarding whether the animal had perished or not.[979] In December 2013, Iran announced that it had sent a second monkey into space.[980] Overall, these efforts appeared to signal a serious space program and, while the Safir rocket carried relatively lightweight loads, the Simorgh space launch vehicle capable of carrying a heavier load caused greater concern.[981] Space security expert Clay Moltz added that Iran's space program was worth watching given the "potential of space technologies to be switched to delivery systems."[982] Overall, Iran made significant strides in developing its missile capabilities through 2013.

c. Nuclear Trends

Iran advanced its nuclear capabilities on all fronts during this time period. It furthered its ability to obtain fissile material, a nuclear warhead, and a delivery vehicle. By 2004, Iran had halted its coordinated weapons program, once elements of its clandestine program were revealed in the 2002 and 2003 timeframe. Both the U.S. intelligence community assessment and the IAEA reports noted that Iran had ended its structured nuclear weapons program in late 2003. However, Iran was determined to move forward while it seemed feasible to do so and was not easily deterred. The bargaining and negotiating that occurred between 2004 and 2013 with first Germany, the United Kingdom, and France and then the P5+1 are evidence of this. The U.S. intelligence community was clear that Iran sought to keep its options open to develop nuclear weapons in the future. What Iran continued to do after 2003 was to build and run its centrifuge capabilities, and thus its capability to enrich uranium, and further develop its

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978 Ibid.

979 Eyder Peralta, "Iran Claims It Has Sent another Monkey into Space," National Public Radio, December 14, 2013, http://www.npr.org/sections/thetwo-way/2013/12/14/251029524/iran-claims-it-has-sent-another-monkey-into-space.

980 Ibid.

981 Crail, "Iran Launches Second Satellite."

982 Clay Moltz, The Space Show: U.S. Space Policy and Strategy, International Space Cooperation and Competition, Podcast, March 25, 2011, http://www.thespaceshow.com/node/372.

delivery systems. Also, the IAEA discovered that Iran had worked on a nuclear explosive device through computer modeling conducted before 2004 and between 2005 and 2009.[983] In addition, the discovery of the Fordow Fuel Enrichment Plant at Qom and Iran's refusal to grant access to the Parchin military complex left many unanswered questions regarding Iran's intentions.

Two shifts occurred during this time period. The first shift was in the 2005 to 2006 time period as Iran sought to move forward again on nuclear weapon-related missile projects such as the work on the Shahab-3 to modify it to carry a high explosive and ended its cooperation with the IAEA. Then, by 2010, while Iran continued to work on projects related to nuclear technology, the IAEA assessed it was no longer working on nuclear weapons.[984]

What drove Iranian nuclear behavior during this time period? In the regional context, Iran and Iraq had been locked in a relationship of conflict and rivalry. Now that Iraq no longer posed a threat, Iran and Saudi Arabia had become regional competitors. Iran likely realized that acquiring a nuclear weapon would allow it to catapult ahead of Saudi Arabia in terms of regional military capabilities. Also, Iran had long claimed a rivalry with Israel. While an Iranian nuclear weapon would not be an "Arab bomb," it would allow Iran to stand up to Israel. Iran had begun its bomb project in reaction to an existential threat from Iraq. With the Iraqi threat gone, enough incentives remained for Iran to pursue a nuclear weapon. However, this was not the whole story. Iran did not charge ahead to develop its nuclear weapons program even though it may have had incentives to do so.

Iran was not willing to continue to pursue a nuclear weapon at any cost. In 2008, the U.S. intelligence community reasoned that "convincing the Iranian leadership to forgo the eventual development of nuclear weapons will be difficult given the linkage many within the leadership see between nuclear weapons development and Iran's key

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983 International Atomic Energy Agency, Board of Governors, Director General, "Final Assessment on Past and Present Outstanding Issues Regarding Iran's Nuclear Program," 14.

984 Ibid.

national security and foreign policy objectives and given Iran's considerable effort from the late 1980s to 2003 to develop such weapons."[985] The initiative of Germany, the United Kingdom, and France launched a possible diplomatic solution. The United States joined their efforts in 2005. The U.S.-led sanctions regime, ultimately supported by Russia, China, the United Kingdom, France, and Germany, brought Iran to the negotiating table in 2013. The great powers came together to place punishing sanctions on Iran. While the United States led the way pushing for a strict sanctions regime, it was Russia and China, motivated by self-interest, joining Germany, the United Kingdom, and France to support sanctions that caused Iran to come to the negotiating table.

3. Iraq

Iraq continued to be racked by domestic conflict following the Second Gulf War. Militarized factions fought on behalf of Iran, Shia leader Muqtada al-Sadr, Saddam Hussein's supporters, and Sunni Islamists such as Al-Qaeda in Iraq. The Iraqi Army and the U.S.-led coalition struggled to end the conflict and bring security and political stability to Iraq. Even though U.S. troops officially left in 2011, the internal conflict did not end with their withdrawal. Seeds scattered from the internal conflict in Iraq would eventually contribute to the civil war in Syria in 2011. Iran would also be in a strategic position to play an influential role in Iraq. On the nuclear front, after decades of pursuing nuclear weapons, Iraq no longer was. The 2004 Iraq Survey Group Report answered lingering questions regarding Saddam Hussein's intentions and capabilities. The report found that intentions were present, but capabilities were absent.

a. Political Context

Following the 2003 U.S.-led invasion, an insurgency took root in Iraq. It targeted the U.S.-led coalition and those seen to be aiding it. Those carrying out the attacks included the mostly Sunni Ba'ath Party officials and military, intelligence, and security

[985] Director of National Intelligence, "Annual Threat Assessment of the Intelligence Community for the House Permanent Select Committee on Intelligence, 2008," 12.

officers.[986] On the other hand, Shia cleric Muqtada al-Sadr also turned and fought against U.S.-coalition members beginning in 2004. Sadr viewed the U.S.-led coalition as an occupying force and directed Shia militants to attack the international forces. In addition, the United States was concerned about foreign fighters coming to Iraq, especially through Syria, to attack coalition forces. For example, Jordanian-born Abu Musab al-Zarqawi led Al-Qaeda in Iraq against coalition forces.

Iran's involvement in the country, particularly Tehran's efforts to gain influence with the Iraqi Shia, formed a sub-plot in Iraq's security situation.[987] In 2009, the U.S. intelligence community assessed that Iran's primary objective was to ensure that Iraq did not present any sort of threat to Iran, either emanating from Iraq itself or the United States in Iraq.[988] To accomplish this goal, Iran's efforts had included: "using propaganda, providing humanitarian assistance, building commercial and economic ties, and supporting Shia elements fighting the coalition" along with providing "lethal support including weapons, funding, training, logistical and operational support, and intelligence training" to Shia militants.[989]

Within the region, the new Iraqi government resumed a more traditional relationship with other states. Official relations resumed between Iraq and Syria in 2006 after nearly a 25-year break. Iranian President Mahmud Ahmadinejad visited Iraq in 2008. The United Arab Emirates foreign minister also traveled to Iraq in 2008. King Abdullah of Jordan visited Baghdad in August 2008 and assigned an Ambassador there in October.[990] To the north, trade relations continued between Turkey and Iraq involving oil

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986 *The Worldwide Threat 2004: Challenges in a Changing Global Context*, Hearings before the Senate Select Committee on Intelligence," Senate, (February 24, 2004) (testimony of George J. Tenet, Director of Central Intelligence), https://www.cia.gov/news-information/speeches-testimony/2004/dci_speech_02142004.html.

987 Kenneth Katzman, "Iran's Activities and Influence in Iraq" (Washington, DC: Congressional Research Service, June 4, 2009), www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA501453.

988 Director of National Intelligence, "Annual Threat Assessment of the Intelligence Community for the Senate Select Committee on Intelligence, 2009," 10.

989 Ibid.; Katzman, "Iran's Activities and Influence in Iraq," 2.

990 Director of National Intelligence, "Annual Threat Assessment of the Intelligence Community for the Senate Select Committee on Intelligence, 2009," 16.

and other commodities. Turkey remained concerned regarding the use of northern Iraq as a safe haven by the Kurdistan Workers' Party, also known as the PKK, but Turkey began to improve its ties with the Kurdistan Regional Government in late 2008.[991]

In terms of domestic politics, the U.S.-led coalition sought to ensure that Shia, Sunni, and Kurds felt adequately represented in Iraq's new government. The Coalition Provisional Authority, headed by Paul Bremer, who had been appointed as a special envoy to Iraq by President George W. Bush in May 2003, handed executive authority over to an interim Iraqi government in mid-2004. Ayad Allawi, a Shia politician, and Barham Saleh, a Kurdish politician, led the interim government until proper elections could be held. In April 2005, Jalal Talabani, a Kurd, became president of Iraq and Ibrahim Jaafari, a Shia, became prime minister. In December, Iraqis went to the polls and elected members of parliament.[992] Then Shia politician Nuri al-Maliki was asked to form a government in May 2006.

Iraq's Arab Sunnis no longer dominated the national government as they had under Hussein. The group responded by boycotting participation in the country's nascent political institutions and processes and, thus, continued to feel sidelined.

By 2006, the insurgency had become more sectarian in nature. The U.S.-led coalition sought ways to bring greater stability to the country. The coalition was able to turn the tide on the Sunni insurgency with the "Sunni Awakening" movement in 2007—Sunni groups that turned against Al-Qaeda in Iraq and cooperated with the Iraqi government. The U.S. intelligence community assessed in early 2006, however, that the Sunni Awakening movement would not sway the most ardent Zarqawi fighters.[993] Zarqawi was killed in an airstrike in June. Then, in December 2006, Hussein was

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991 Ibid.

992 Kyle Crichton, Gina Lamb, and Rogene Fisher Jacquette, "Timeline of Major Events in the Iraq War," *New York Times*, accessed February 3, 2017, http://www.nytimes.com/interactive/2010/08/31/world/middleeast/20100831-Iraq-Timeline.html#/#time111_3296.

993 Director of National Intelligence, "Annual Threat Assessment of the Director of National Intelligence for the Senate Select Committee on Intelligence, 2006," 8.

executed by hanging. By early 2009, the Sunni insurgency, the threat from Al-Qaeda in Iraq, and the threat from Shia militants had begun to decrease.[994]

Iraq's political and security situation showed signs of improvement by 2009. Parliamentary elections were held in March 2010. The United States withdrew its combat forces in late 2010. Despite some disagreement among members of the U.S. administration regarding the timeline for ending the U.S. military presence in Iraq, the military drew down through December 2011 as the result of the U.S.-Iraq bilateral security agreement.[995]

Following the U.S. withdrawal, the relationship between Shia, Sunni, and Kurdish populations remained strained. Tension persisted between Prime Minister Maliki and Kurdistan Regional Government President Masud Barzani as Barzani sought greater autonomy for the Kurdish region to include independent oil agreements. Maliki also purged high-level Sunni officials, such as Vice President Tariq al-Hashimi, from government after the U.S. departure.[996] Hashimi fled to Turkey and lived in exile there. As predicted by Liam Anderson and Gareth Stansfield, rather than a common Iraqi identity, the trend was toward greater divisions along ethnic and sectarian lines.[997] In 2012, the U.S. intelligence community assessed that continuing poor relations between the political leadership of the three groups would lead to instability in Iraq.[998]

In 2013, the civil unrest in Syria began to affect stability in Iraq. The U.S. intelligence community assessed that Al-Qaeda in Iraq attacks were occurring in Iraq at a rate of approximately 68 to 80 every month—a level not seen since the 2007 to 2008

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994 Director of National Intelligence, "Annual Threat Assessment of the Intelligence Community for the Senate Select Committee on Intelligence, 2009," 15.

995 Crichton, Lamb, and Jacquette, "Timeline of Major Events in the Iraq War."

996 Ali Khedery, "Why We Stuck with Maliki—and Lost Iraq," *Washington Post*, July 3, 2014, sec. Opinion, https://www.washingtonpost.com/opinions/why-we-stuck-with-maliki--and-lost-iraq/2014/07/03/0dd6a8a4-f7ec-11e3-a606-946fd632f9f1_story.html?utm_term=.7e9ec2d8e7b7.

997 Anderson and Stansfield, *The Future of Iraq*, 252.

998 Director of National Intelligence, "Unclassified Statement for the Record on the Worldwide Threat Assessment of the U.S. Intelligence Community for the Senate Select Committee on Intelligence, 2012," 17.

timeframe.[999] Furthermore, according to the U.S. intelligence community, the Syria war had led to an increase in Sunni extremists crossing back and forth between Syria and Iraq contributing to Al-Qaeda in Iraq conducting a greater number of prominent attacks.[1000] The United States and its allies had not been able to secure a more peaceful and stable Iraq.

In terms of regional rivalry, the sea change in Iraq's domestic political dynamics and the end of Iraq's nuclear bluffing and hedging shifted the regional balance of power. The conflict dyad between Iran and Iraq came to an end. During this time period, Iraq became more aligned with Shia Iran and the Shia populations dispersed throughout the region serving as a potential counterweight to the region's Sunni monarchies, primarily the Gulf States. But it would be wrong to assume that Iraq would always align with Iran. Sean Foley noted that "it is significant that Iraqi Shia clerics are Arab and therefore carry an authority among Gulf Arab Shia that is unmatched by their Iranian colleagues."[1001]

b. Nuclear Program

Iraq had been a focus of proliferation concern for decades, but it no longer was after the Second Gulf War. The Iraq Survey Group, appointed to investigate Iraq's nuclear program, finished its work and published the Duelfer Report in 2004. The report confirmed that Iraq had not had the nuclear capability that the U.S. administration believed it possessed. As discussed in the previous chapter, Saddam Hussein had not been able to reconstitute Iraq's nuclear weapons program.

As the decade progressed, Iraq seemed to further integrate itself into the nonproliferation regime. According to Alissa J. Rubin and Campbell Robertson of the *New York Times,* Iraq sold its yellowcake stockpile to Cameco of Canada in 2008.[1002] In

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[999] Director of National Intelligence, "Statement for the Record, Worldwide Threat Assessment of the U.S. Intelligence Community for the Senate Select Committee on Intelligence, 2014," 15.

[1000] Ibid.

[1001] Foley, *The Arab Gulf States*, 153.

[1002] Alissa J. Rubin and Campbell Robertson, "Yellowcake Removed from Iraq Nuclear Site," *New York Times*, July 7, 2008, https://www.nytimes.com/2008/07/07/world/africa/07iht-iraq.4.14301928.html.

addition, Iraq ratified the Additional Protocol in 2012 and the Comprehensive Nuclear Test Ban Treaty in 2013.

In 2009, Iraq sought to join the wave of countries in the Middle East interested in nuclear power by announcing that it had invited France to help the country construct a nuclear power plant.[1003] The stated purpose for nuclear power plants was for electricity generation. In December 2010, the UN Security Council ended the oil-for-food program and the restrictions on programs for nuclear energy development. However, as of 2013, Iraq had not made any significant progress toward reaching this goal.

In terms of delivery systems, the information examined here seems to indicate that Iraq did not increase its ballistic missile capabilities during this period. Furthermore, Iraq joined the Hague Code of Conduct against Ballistic Missile Proliferation, which seeks to discourage ballistic missile production, in 2011.[1004]

c. Nuclear Trends

Iraq's pursuit of nuclear weapons—fissile material, a nuclear warhead, or a delivery vehicle—did not increase during this time period. Rather, the country moved away from its past nuclear weapons program and further assimilated itself into the nonproliferation regime.

What drove Iraq's nuclear behavior during this time period? In the regional context, the rivalry between Iraq and Iran had decreased after the Second Gulf War due to the presence of a Shia-led government in Iraq and Iran's increased influence in the country. The country no longer posed a threat to the Gulf States or Israel. At the international level, two wars had just been fought with Iraq's alleged possession of nuclear weapons as a reason for the conflict. The great powers would not have looked kindly on Iraq's leadership rekindling the issue. Furthermore, due to the United States'

1003 "Iraq Invites France Back to Build Nuclear Plant," *Al Arabiya News*, February 22, 2009, http://www.alarabiya.net/articles/2009/02/22/66994.html.

1004 U.S. Department of State, "Hague Code of Conduct against Ballistic Missile Proliferation (HCOC)," accessed February 17, 2017, http://www.state.gov/t/isn/trty/101466.htm.

efforts from 1991 to 2003, little remained of Iraq's program. External management seemed to continue to influence Iraq's nuclear decision-making.

4. Libya

Libya sought to move from international pariah to respected state after renouncing its nuclear program and agreeing to restrict its missile capabilities. Libya's relationship with the West improved as it dismantled its nuclear program. The fabric of the country quickly unraveled, however, with the onset of the Arab Uprising. Muammar Qaddafi was killed in 2011. By 2013, the United States and the United Kingdom, assisted by Russia, had removed the components of Libya's nuclear program while, politically, the country remained unstable, dominated by militia.

a. Political Context

Libyan relations with the West continued to improve after Libya renounced its nuclear program in 2003. In 2004, the United States lifted economic sanctions and began to re-establish official relations with Libya. U.S. citizens were once again allowed to travel to Libya, the first time since 1981. In September 2004, the United States lifted its trade embargo against Libya allowing oil imports to resume. In 2005, U.S. restrictions on business dealings with Libya were lifted.[1005] Full diplomatic relations with the United States were in place by mid-2006. The United States also removed Libya from the U.S. State Department's State Sponsors of Terrorism list that year. Finally, the Iran-Libya Sanctions Act was changed to the Iran Sanctions Act in 2006, as it no longer applied to Libya.

Libya seemed to be transitioning well from being a pariah state to having a greater role in regional leadership. At the beginning of 2008, Libya achieved a position on the UN Security Council. Then, in May 2008, Libya agreed to fund compensation for the victims of the past Libyan-sponsored airplane bombings over Scotland and Niger and discotheque bombing in Germany. This lead to the U.S. secretary of state meeting with Qaddafi in September 2008, marking the normalization of relations between the two

[1005] "Profile for Libya—Nuclear."

countries. And a U.S. ambassador to Libya was appointed in November 2008. In 2009, Qaddafi became the chairman of the African Union. Also, Qaddafi addressed the UN General Assembly on his first visit to the United States. And he took part in that year's G8 Summit.

By contrast, Qaddafi continued to have rocky regional relations. In 2007, Qaddafi chose not to attend the Arab League Summit in Riyadh as a protest, allegedly regarding a disagreement with Saudi Arabia. Then, in March 2008, Qaddafi lobbed criticism against Arab countries for not stopping the United States from invading Iraq in 2003.

Political stability sharply decreased with the coming of the Arab Uprising. Protests reached Libya in February 2011. The relations that Qaddafi had been working to improve sharply deteriorated. Juxtaposed against the previous seven years, relations with the United States, Europe, and the Middle East declined quickly due to Qaddafi's crackdown on Libyan protesters. The Arab League suspended Libya's membership and a United Nations coalition began military operations to halt attacks on Libyan rebels. Saudi Arabia, Qatar, and the United Arab Emirates aided the rebels. The UN Security Council authorized a no-fly zone, which was enforced by the North Atlantic Treaty Organization.[1006] Qaddafi wrote a letter to U.S. President Barack Obama asking him to end the military operations. Nevertheless, the international community was not dissuaded. Rebel forces had taken over the country by August and Qaddafi was killed on October 20.

A weak central government, factional fighting, and instability persisted after Qaddafi's death. The National Transitional Council claimed power and the country moved forward to choose a new government and elections were held in mid-2012. The U.S. intelligence community cautioned, "the interim government needs to assert its

1006 "That It Should Come to This," *Economist*, January 10, 2015, http://www.economist.com/news/briefing/21638123-four-year-descent-arab-spring-factional-chaos-it-should-come.

authority without igniting divisions among Libya's various stakeholders. It also needs to work toward disbanding and integrating the country's various militias."[1007]

The United States was a victim of Libya's internal chaos in 2012 when a militia attacked the U.S. Consulate in Benghazi, Libya on September 11. The U.S. ambassador to Libya, Christopher Stevens, was killed during this attack along with other consulate staff.

As of 2013, Libya's security situation remained complex. The U.S. intelligence community reported to congress that "the institutional vacuum caused by Qaddafi's removal increased terrorist activity and gave rise to hundreds of well-armed regional militias, many of which played key roles in overthrowing the regime but now complicate Libya's stability."[1008] Libya had started the period with high hopes for re-integration into the region and the international community. Nevertheless, Qaddafi's successors were unsuccessful at unifying the country, much less becoming an influential player on the international scene.

b. Nuclear Program

Libya's nuclear disarmament decision was deemed a remarkable nonproliferation success story.[1009] And, guided by the United States and the United Kingdom, Libya continued to distance itself from its nuclear past. In 2004, Libya continued the disarmament it had committed to in late 2003. Director of Central Intelligence Porter J. Goss reported to Congress in early 2005 that Libya moved forward in cooperating with

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[1007] Director of National Intelligence, "Unclassified Statement for the Record on the Worldwide Threat Assessment of the U.S. Intelligence Community for the Senate Select Committee on Intelligence, 2012," 14–15.

[1008] Director of National Intelligence, "Statement for the Record, Worldwide Threat Assessment of the U.S. Intelligence Community for the Senate Select Committee on Intelligence, 2013," 17.

[1009] It is important to note, however, that proliferation experts have emphasized that Libya lacked the infrastructure required to produce fissile material indigenously. For example, please see Bowen, *Libya and Nuclear Proliferation*, 82.

the IAEA and relinquished the primary components of its nuclear weapons program.[1010] Sixteen kilograms of highly enriched uranium were removed from Tajura in March and downblended by Russia, according to the Nuclear Threat Initiative.[1011] Libya looked poorly, however, when, according to Michael Laufer, previously ordered centrifuge parts arrived in Libya in March 2004 on the cargo ship BBC China from the A.Q. Khan network.[1012]

Due to its disarmament decision, Libya rose as a voice for regional nonproliferation. In January 2004, Libya ratified the Comprehensive Test Ban Treaty. In January 2005, Libya's legislature called for a weapons-of-mass-destruction free zone in Africa and the Middle East.[1013] In March 2005, Libya ratified the Treaty of Pelindaba, the African NWFZ Treaty.

As Libya normalized its political relations with the West, the country was praised for its disarmament decision. The United States, in particular, publicly applauded Libya's disarmament choice. At the May 2005, NPT Review Conference, the U.S. assistant secretary of state for arms control stated that "Libya has joined other states, including South Africa, Ukraine, Belarus and Kazakhstan, that have wisely concluded that their security interests are best served by turning away from nuclear weapons . . . . This demonstrates that, in a world of strong nonproliferation norms, it is never too late to make the decision to become a fully compliant NPT state."[1014]

[1010] *Global Intelligence Challenges 2005: Meeting Long-Term Challenges with a Long-Term Strategy*, Hearing Before the Senate Select Committee on Intelligence, Senate (February 16, 2005) (testimony of Porter J. Goss, Director of Central Intelligence), https://www.cia.gov/news-information/speeches-testimony/2005/Goss_testimony_02162005.html.

[1011] "Profile for Libya—Nuclear."

[1012] Michael Laufer, "A. Q. Khan Nuclear Chronology," Carnegie Endowment for International Peace, September 7, 2005, http://carnegieendowment.org/2005/09/07/a.-q.-khan-nuclear-chronology-pub-17420.

[1013] "Libya Calls on All Countries to Scrap WMDs," *Pan African News Agency*, January 13, 2005, http://www.panapress.com/Libya-calls-on-all-countries-to-scrap-WMDs--13-560736-17-lang2-index.html.

[1014] U.S. Department of State, "Statement by Stephen G. Rademaker, United States Assistant Secretary of State for Arms Control to the 2005 Review Conference of the Treaty on the Non-Proliferation of Nuclear Weapons" (Washington, DC, May 2, 2005), 1, http://www.un.org/en/conf/npt/2005/statements/npt02usa.pdf.

Meanwhile, the IAEA worked to finish investigating Libya's nuclear program. The IAEA had a number of questions in August 2004 regarding Libya's "acquisition of UF_6 uranium conversion technology and enrichment technology," "the role of the clandestine supply network," and "sources of contamination of some enrichment related equipment" and continued to inspect and review Libya's program from 2004 through 2007. The IAEA reported in 2008, that following its investigations beginning in September 2004, "the agency has concluded that Libya's current capabilities are not suited for the design or manufacturing of nuclear weapon components. Nor has the Agency found any indications of work related to nuclear weapons development."[1015] Thus, the IAEA highlighted Libya's compliance since inspections began in 2004.

Once it was in good standing with the international community, Libya moved forward with plans to develop a civilian nuclear program. Between 2006 and 2008, Libya signed nuclear cooperation agreements with Argentina, Canada, France, the Ukraine, and Russia.[1016] The cooperative agreement with France included plans for a desalination plant.[1017] Libya was particularly interested in nuclear power.[1018] In 2008, Libya created the Nuclear Energy Corporation to advance the country's nuclear power ambitions.[1019] In 2010, the Libyan Atomic Energy Institute had begun site selection and to establish the legal framework for nuclear power plant construction.[1020]

Libya's nuclear weapons program had been nearly completely dismantled by 2009. Maria Rost Rublee noted that the last of Libya's highly enriched uranium, and perhaps Qaddafi's remaining leverage, was transported out of the country to Russia in late 2009.[1021] Richard Spencer wrote in *The Telegraph* in September 2011 that Libyan

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[1015] International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement in the Socialist People's Libyan Arab Jamahiriya," September 12, 2008, Annex, 5, http://www.isis-online.org/publications/libya/IAEA_Libya_Report_12September2008.pdf.

[1016] "Profile for Libya—Nuclear."

[1017] "Emerging Nuclear Energy Countries."

[1018] Ibid., "Profile for Libya—Nuclear."

[1019] "Profile for Libya—Nuclear."

[1020] "Emerging Nuclear Energy Countries."

[1021] Rublee, "Leadership Transitions and Nuclear Futures in Egypt and Libya," 77.

rebel forces discovered a cache of yellowcake uranium from Niger in an abandoned building.[1022] As the yellowcake had not been further processed, it did not pose an immediate security threat and the IAEA announced it would visit the facility for safeguarding purposes once the security situation improved, according to Spencer.[1023] As of 2013, according to the IAEA, Libya primarily maintained a 10MW IRT-1 research reactor, which was temporarily shutdown, at the site of the former Tajura Nuclear Research Center.[1024]

Qaddafi was not fully satisfied with his gains from giving up the country's nuclear capabilities. In June 2009, Qaddafi complained that he had not seen enough rewards result from Libya's decision to relinquish its nuclear weapons program.[1025]

In addition to ending its nuclear program, Libya agreed to restrict its missile capabilities. The U.S. Department of State noted that Libya had decided to adhere to the protocol of the Missile Technology Control Regime by December 2003.[1026] Conforming to the regime meant missiles with a range over 300 km and a weapons payload over 500 kg were banned. The U.S. State Department reported that by September 2004 Libya's Scud C missiles were removed and Libya agreed to get rid of its Scud B missiles.[1027] Nevertheless, Nathan E. Busch and Joseph F. Pilat asserted that while Libya agreed to reduce the range and payload capacity of its Scud-B missiles, it still maintained some of its original stock of missiles in 2011.[1028] Finally, like other countries in the region, Libya

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[1022] Richard Spencer, "Dumped in the Desert ... Gaddafi's Yellowcake Stockpile," *The Telegraph*, September 25, 2011, http://www.telegraph.co.uk/news/worldnews/africaandindianocean/libya/8787721/Dumped-in-the-desert-...-Gaddafis-yellowcake-stockpile.html.

[1023] Ibid.

[1024] Research Reactor Database.

[1025] Stephen Brown and Philip Pullella, "Gaddafi Complains Not 'Rewarded' for Renouncing WMD," *Reuters*, June 11, 2009, http://www.reuters.com/article/us-italy-libya-idUSTRE55A3J520090611.

[1026] U.S. Department of State, Bureau of Public Affairs, "Libya's Decision to Eliminate WMD and MTCR-Class Missile Programs: An International Model" (Washington, DC, May 15, 2006), https://2001-2009.state.gov/r/pa/prs/ps/2006/66245.htm.

[1027] Ibid.

[1028] Nathan E. Busch and Joseph F. Pilat, "Disarming Libya? A Reassessment after the Arab Spring," *International Affairs* 89, no. 2 (March 2013): 459.

began to look at missile defense. For example, in 2010, Libya expressed interest in a Russian air defense system, according to the Nuclear Threat Initiative.[1029]

c. Nuclear Trends

During this time period, Libya dismantled its nuclear weapons program, joined nonproliferation regime treaties, and became more involved in the international community. While Libya expressed interest in nuclear power, it did not make significant progress on this front and did not approach mastering a complete nuclear fuel cycle. Overall, nuclear proliferation efforts in Libya sharply decreased during this time period. By dismantling its nuclear program, the country moved away from acquiring fissile material and a weapons design. The country also agreed to limit its ballistic missile capacity and thus reduced its delivery vehicle capabilities.

Its compliance in the nonproliferation arena, however, did not save the Qaddafi regime from the effects of the 2011 Arab Uprising. It was pulled apart by both domestic and regional political forces as Saudi Arabia, Qatar, and the United Arab Emirates were quick to join the coalition against Qaddafi. By 2013, after Qaddafi's death, warring militia groups dominated the domestic political and security scene.

What drove Libya's nuclear behavior during this time period? In the regional context, conflict and rivalry had persisted. In addition to the regional turmoil from conflicts in Iraq and the Levant, the Gulf States had quickly decided to aid the rebels at the time of the Arab Uprising in Libya. The Libyan government had few friends in the region. At the international level, secret negotiations between Libya, the United Kingdom, and the United States had brought Libya to its 2003 public disarmament announcement.[1030] In 2004, it was the United States and the United Kingdom that continued to work with Libya to implement the decision. They were joined by the IAEA and Russia. Europe joined in and also ended sanctions against Libya. The great powers came together to continue influencing Libya's behavior as part of an overall effort to end

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[1029] "Profile for Libya—Missile."

[1030] Bowen, *Libya and Nuclear Proliferation*, 47.

Libya's state sponsorship of terrorism and nuclear proliferation—an international management headache. They were the driving force behind this decrease.

5. Saudi Arabia

Saudi Arabia emerged as a more powerful regional player following the Second Gulf War. As the United States withdrew from the region, Saudi Arabia sought to fill some of the vacuum to bolster its own security interests. In particular, its rivalry with Iran increased and Saudi Arabia looked to head off Iranian influence in the region. This led to much speculation as to whether Saudi Arabia would seek to acquire a nuclear deterrent due to the security competition between the two countries. Nevertheless, Saudi Arabia's nuclear capabilities changed little over the time period. By 2013, Saudi Arabia's nuclear capabilities did not approach mastering a complete nuclear fuel cycle, which might be characterized as a nuclear hedge.

a. Political Context

The Second Gulf War altered the balance of power in the Middle East. In the new balance of power, Saudi Arabia played a more prominent role. Unlike the First Gulf War, Saudi Arabia did not publicly support the U.S.-led coalition in the Second Gulf War. Saudi Arabia, along with the Arab League, opposed the U.S.-led invasion of Iraq. Its neighbor Kuwait was the only Gulf state that supported the war. While Saudi Arabia did not have a good relationship with Iraq, it became very concerned about the country's instability and the growing influence of Iran over Iraq following the invasion. Saudi Arabia watched as Iraq came to be dominated by Shia, more closely aligned with Iran, rather than by Sunni. In 2005, Saudi Foreign Minister Prince Saud al-Faisal commented, "United States policy in Iraq is widening sectarian divisions to the point of effectively handing the country to Iran."[1031] He continued: "we fought a war together to keep Iran out of Iraq, now we are handing the whole country over to Iran without reason . . . Iraq is disintegrating."[1032] Furthermore, Saudi Arabia remained concerned about Iran's

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[1031] Claude Salhani, "Analysis: Fragmented Iraq: Saudi Challenge," *United Press International*, April 7, 2006, http://www.upi.com/Analysis-Fragmented-Iraq-Saudi-challenge/40831144427759/.

[1032] Ibid.

intentions regarding its nuclear program. The Saudi-Iran rivalry would come to a head in 2011 with Iran's attempt to orchestrate the assassination of the Saudi ambassador to the United States. Saudi Arabia now confronted two significant security challenges: the rise of Iran and its support for Shia political groups and the rise of Salafist terrorist groups like Al-Qaeda.

In terms of regional conflicts, Saudi Arabia was against Lebanese Hezbollah in its 2006 war against Israel. Also, Saudi Arabia continued its involvement with the Palestinian issue. The country supported the Mecca Agreement in February 2007 to repair Hamas–Fatah relations. Saudi Arabia strongly opposed Israel's War on Gaza in 2009 and continued to refuse to officially recognize Israel.

Saudi Arabia remained frustrated with U.S. foreign policy in the region. When U.S. Secretary of State Condoleezza Rice noted in 2006 that the conflict in Lebanon indicated "the birth pangs of a new Middle East," Faisal responded that Saudi Arabia wanted "to go back to the old Middle East" and added that the new Middle East had "more problems and more disasters."[1033]

Saudi Arabia focused on its own domestic issues, given the presence of Al-Qaeda, a Salafist terrorist group, in the country. The U.S. intelligence community noted in early 2008 that since 2003 Saudi Arabian forces had had success in "killing or capturing Al-Qaeda's original Saudi-based leadership and degrading its manpower, access to weapons, and operational capability."[1034] The intelligence community further noted, however, that Saudi Arabia continued to be "a source of recruits and finances for Iraq and Levant-based militants and Saudi extremists constitute the largest share of foreign fighters and suicide bombers in Iraq."[1035] Furthermore, in 2010, the U.S. intelligence community reported that Al-Qaeda in the Arabian Peninsula sought to conduct attacks in Yemen and Saudi

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[1033] Foley, *The Arab Gulf States*, 142.

[1034] Director of National Intelligence, "Annual Threat Assessment of the Intelligence Community for the House Permanent Select Committee on Intelligence, 2008," 27.

[1035] Ibid.

Arabia.[1036] The country was indeed dealing with its own terrorist challenge, both in terms of being a terrorist target and a source for funding and recruits given the country's historical support for Wahhabism, a version of Salafism.

In late 2010, Saudi Arabia's security challenges increased as the Arab Uprising spread from one country to another. Saudi Arabia had two interests related to the uprising: 1) in its rivalry with Iran, it did not wish to see Iran or Shia groups gain power and influence regionally; and 2) it wished to ensure that the Muslim Brotherhood did not gain power and influence regionally or domestically. The Saudi leadership feared the Muslim Brotherhood's "blend of Islam and politics as well as its avowed embrace of democracy."[1037] These two interests drove Saudi Arabia's actions from late 2010 through 2013, the end of the time period. Salloukh wrote that Saudi leadership remained focused on three things: protecting the kingdom from the Arab Uprising, ensuring the continuation of its monarchy, and combatting Iran's regional efforts.[1038] The United Arab Emirates supported and assisted Saudi Arabia with its regional efforts.

In response to the Arab Uprising, which began in Tunisia in December 2010, Saudi Arabia offered refuge to Tunisia's president. Then, in February 2011, protests occurred in Doha, Bahrain and Saudi Arabia intervened. First, on May 14, 2011, Saudi Arabia and Bahrain declared closer security cooperation in the Riyadh Declaration to stem greater protests.[1039] Second, on May 15, 2011, when it seemed that Bahrain's security forces might be overpowered, Saudi Arabia helped subdue Shia protests and the United Arab Emirates helped reinforce Bahrain's troops.[1040]

[1036] Director of National Intelligence, "Annual Threat Assessment of the U.S. Intelligence Community for the Senate Select Committee on Intelligence, 2010," February 2, 2010, 10, https://www.dni.gov/files/documents/Newsroom/Testimonies/20100202_testimony.pdf.

[1037] David D. Kirkpatrick, "Saudis Put Terrorist Label on Muslim Brotherhood," *New York Times*, March 7, 2014, http://www.nytimes.com/2014/03/08/world/middleeast/saudis-put-terrorist-label-on-muslim-brotherhood.html.

[1038] Salloukh, "The Arab Uprisings and the Geopolitics of the Middle East," 40.

[1039] Hassan, "Undermining the Transatlantic Democracy Agenda? The Arab Spring and Saudi Arabia's Counteracting Democracy Strategy," 488.

[1040] Khoury, "The Arab Cold War Revisited: The Regional Impact of the Arab Uprising."

After the January 2011 protests in Yemen, Saudi Arabia sought to mediate the political outcome. The Gulf Cooperation Council, led by Saudi Arabia, helped negotiate a political settlement and the departure of President Ali Abdullah Saleh in November. Elections were held in early 2012. Of particular concern for Saudi Arabia was that the Shia rebels, the Huthis, did not take control of the country.

In Syria, the regime accused Saudi Arabia of arming opposition forces in its civil war, which began in March 2011. The Saudi-Iranian rivalry clearly demonstrated itself in the Syrian conflict as Iran supported the government and Saudi Arabia supported the opposition. Salloukh noted that "Riyadh's determination to reorient Syria away from 'the axis of resistance' toward the Saudi-U.S. camp developed into an overlapping regional-international geopolitical contest pitting Saudi Arabia, the U.S., France, Turkey, Qatar, and Saad al-Hariri's Future Movement against Iran, Russia, China, and Hezbollah."[1041] As Saudi Arabia worked against Iran throughout the region, the stakes were particularly high in Syria given Syria's close relationship with Iran.

In Egypt, Saudi Arabia vehemently opposed the Muslim Brotherhood's rise to power and alleged U.S.-abandonment of its longtime ally Mubarak in 2011. Khoury wrote that the leadership of Saudi Arabia and the United Arab Emirates were displeased with Hosni Mubarak stepping down from office and U.S. support for his departure, believing that the United States had abandoned its ally.[1042] Saudi Arabia opted to offer financial incentives to Egyptian elites working against the Muslim Brotherhood and then partnered with the Egyptian military when they took over the government from the Muslim Brotherhood in 2013.[1043]

In Libya, Saudi Arabia was quick to support opposition forces. Khoury noted that while Saudi Arabia and Qatar provided financial assistance to Libyan opposition groups,

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[1041] Salloukh, "The Arab Uprisings and the Geopolitics of the Middle East," 41.

[1042] Khoury, "The Arab Cold War Revisited: The Regional Impact of the Arab Uprising."

[1043] Hassan, "Undermining the Transatlantic Democracy Agenda? The Arab Spring and Saudi Arabia's Counteracting Democracy Strategy," 485.

Saudi Arabia focused on Wahhabi/Salafi groups and Qatar focused on political groups like the Muslim Brotherhood.[1044]

At the close of 2013, Saudi Arabia and the Gulf States, with the exception of Yemen, remained a sub-region of relative stability in a tumultuous region. Saudi Arabian economic and defense capabilities had been sufficient to ward off conflict closer to home. But Iran had managed to keep Syria's Assad in power.

b. Nuclear Program

In the midst of the regional turmoil following the Second Iraq War, Saudi Arabia announced its intent to build a nuclear power program for energy and desalination as part of a Gulf Cooperation Council effort in 2006. Saudi Arabia's interest in developing its nuclear capabilities coincided with growing regional alarm regarding Iran's nuclear program. The *Sunday Times* (London) quoted Prince Mohammed bin Nawaf bin Abdulaziz, Saudi Arabia's Ambassador to the United Kingdom, in November 2013 as responding that "all options are available."[1045] In addition, Middle East expert Bruce Reidel has suggested that Saudi Arabia may have an agreement for Pakistan to provide a nuclear umbrella to shield Saudi Arabia.[1046]

Saudi Arabia moved forward with its plans for nuclear power. In 2007, the IAEA and the Gulf Cooperation Council agreed to undertake a nuclear power feasibility study. Saudi Arabia signed a nuclear memorandum of understanding with the United States in 2008 and nuclear cooperation agreements with France in 2011, Argentina in 2011, South Korea in 2011, and China in 2012.[1047] In 2009, Saudi Arabia decided it would establish its own nuclear power program and set up the King Abdullah City for Atomic and

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[1044] Khoury, "The Arab Cold War Revisited: The Regional Impact of the Arab Uprising."

[1045] Roger Boyes and Roland Watson, "Saudi Arabia Turns Up Heat on the West Over Possible Iran Nuclear Deal," *The Times*, November 22, 2013, https://www.thetimes.co.uk/article/saudi-arabia-turns-up-heat-on-the-west-over-possible-iran-nuclear-deal-sx6d77z2k06.

[1046] Bruce Riedel, "Saudi Arabia: Nervously Watching Pakistan," Op-Ed (Washington, DC: Brookings Institution, January 28, 2008), https://www.brookings.edu/opinions/saudi-arabia-nervously-watching-pakistan/.

[1047] "Profile for Saudi Arabia—Nuclear," Nuclear Threat Initiative, accessed April 19, 2016, http://www.nti.org/learn/countries/saudi-arabia/nuclear/.

Renewable Energy.[1048] In June 2011, the country announced that it planned to create a nuclear energy program and construct 16 nuclear power reactors within a timeline of 20 years.[1049] As of late 2013, Saudi Arabia was working on a research reactor that would be operated by the King Abdullah City for Atomic and Renewable Energy, however, no significant progress had been made on developing the country's nuclear power program.[1050]

Why did Saudi Arabia not make more progress on its nuclear program by 2013? Writing in 2010, Ibrahim Al-Marashi noted the paucity of "domestic physical resources and scientific infrastructure" in Saudi Arabia for a nuclear program even though the Kingdom had an abundance of financial resources.[1051] Additional challenges consisted of the lack of experience of Saudi scientists in the nuclear field, the lack of nuclear infrastructure, and the lack of a developed legal framework for a nuclear program.[1052] The private sector viewed Saudi Arabia's situation in a similar light. International energy companies surveying the regional market in this timeframe viewed Saudi Arabia as the only country, aside from the United Arab Emirates where a nuclear power plant was already under construction, which possibly would pursue nuclear power.[1053] Given that little had been done to develop the legal framework for nuclear power, it did not seem that the Kingdom would realize this ambition in the near-term.[1054] This seemed to indicate that Saudi Arabia placed a high value on the idea that it could buy a nuclear capability if it chose to, but had not prioritized the implementation of those ideas. Further, there was no evidence of any nuclear weapons assistance from Pakistan. Neither did Saudi Arabia acquire additional ballistic missiles that could be used as a delivery

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[1048] "Nuclear Power in Saudi Arabia," World Nuclear Association, October 2016, http://www.world-nuclear.org/information-library/country-profiles/countries-o-s/saudi-arabia.aspx.

[1049] Pervez Hoodbhoy, "Pakistan, the Saudis' Indispensable Nuclear Partner," *New York Times*, April 21, 2015, http://www.nytimes.com/2015/04/22/opinion/toward-a-saudi-pakistani-rift.html.

[1050] Research Reactor Database.

[1051] Al-Marashi, "Saudi Petro-Nukes?" 76.

[1052] Ibid., 79.

[1053] Background discussions with international energy company executives responsible for the Middle East region.

[1054] Ibid.

vehicle. It served Saudi Arabia's interests, however, that there was speculation regarding whether or not the country might acquire a nuclear weapon.

Nevertheless, Saudi Arabia's commitments to the nonproliferation regime increased during this time period. The country acceded to the Safeguards Agreement in 2005, with a Small Quantities Protocol amendment. The agreement came into force in 2009. Also, Saudi Arabia supported the idea of a weapons-of-mass-destruction free zone in the Middle East.[1055]

c. Nuclear Trends

Saudi Arabia's interest in nuclear energy increased in the mid-2000s signaled by its announcement regarding nuclear power in 2006. This initiative occurred in the midst of increasing regional conflict and rivalry with Iran. In the regional context of Iran as a possible nuclear power, there was reason to be concerned about how Saudi Arabia would respond. Frederic Wehrey noted that "Saudi Arabia and its Gulf neighbors have performed a delicate balancing act in their policies toward Iran, seeking to manage the nuclear threat through accommodation rather than confrontation, publicly voicing their disapproval of a U.S. strike, and making calls for WMD-free zone in the Gulf and the Middle East."[1056]

By late 2013, however, much work remained to break ground on a nuclear power plant. Little progress had been made on what might be characterized as a possible hedging strategy on the part of Saudi Arabia.[1057] Overall, nuclear proliferation did not increase in Saudi Arabia from 2004 to 2013. The country had not made progress toward the acquisition of fissile material, weapons design, or a delivery vehicle.

1055 "Profile for Saudi Arabia—Nuclear."

1056 Frederic M. Wehrey et al., *Saudi-Iranian Relations since the Fall of Saddam: Rivalry, Cooperation, and Implications for U.S. Policy*, RAND Corporation Monograph Series (Santa Monica, California: RAND, 2009), 67.

1057 James Russell, "Nuclear Proliferation and the Middle East's Security Dilemma: The Case of Saudi Arabia," in *Over the Horizon Proliferation Threats*, ed. James Wirtz and Peter Lavoy (Palo Alto, CA: Stanford Security Studies, 2012), 62.

What drove Saudi Arabia's nuclear behavior during this time period? As 2013 came to a close, the country remained mired in regional challenges and its rivalry with Iran was at a fever pitch. Saudi Arabia's nuclear efforts on the ground from 2004 to 2013, however, did not match its regional angst. Saudi Arabia's lack of a response in the nuclear realm seems to speak volumes regarding what the country perceived was an acceptable solution to its security concerns. Its ally, the United States, had focused heavily on curtailing regional nuclear proliferation since 1991. What sort of response would Saudi Arabia receive, if the United States discovered that Saudi Arabia sought to acquire nuclear weapons? Despite Saudi Arabia's wealth, it focused on proxy warfare in its regional battlegrounds with Iran. If it did not have concerns regarding a response from its ally the United States, it is reasonable to think that Saudi Arabia may have been more aggressive in its pursuit of a nuclear weapon.

6. Syria

Syria faced heightened instability and conflict after the Second Gulf War. Al-Qaeda in Iraq used the porous border between Iraq and Syria to fight U.S. troops. Syria also continued its conflict with Israel by supporting Hamas and Hezbollah. As Syria became more isolated in the region, it drew closer to Iran. In the midst of this conflict, Syria moved forward on a covert nuclear reactor. Israel assessed that the facility was for a weapons program and bombed it in 2007 after discussing the situation with the United States.[1058] Following this attack on its suspected nuclear weapons facility, Syria made no further progress on its nuclear program. In 2011, civil war broke out in Syria following Arab Uprising protests. The country remained mired in conflict through 2013.

a. Political Context

Syria began this period playing its historical role of supporting Palestinian rejectionist groups against Israel with assistance from Iran. Syria assessed it had gained

[1058] George W. Bush, *Decision Points*, First Edition (New York: Crown Publishers, 2010), 421; Office of the Director of National Intelligence, "Background Briefing with Senior U.S. Officials on Syria's Covert Nuclear Reactor and North Korea's Involvement," 3.

regional support following Hezbollah's 2006 war with Israel.[1059] Hezbollah had surpassed expectations in its ability to resist Israel. Following the war, Syria continued to support groups like Hamas, the Palestine Islamic Jihad, and the Popular Front for the Liberation of Palestine—General Command.[1060] Syria supported Hamas in its 2008 to 2009 conflict with Israel. Israel and Syria held periodic peace talks, the latest being in 2010, which included an offer for a possible Israeli withdrawal from the Golan Heights.[1061]

Syria's regional political positions, however, hurt its economy. Unlike the First Gulf War in 1991, Syria did not support the U.S.-led invasion of Iraq in 2003. Syria took the position of opposing the United States. Raymond Hinnebusch noted that Syria paid an economic price for going against the United States in Iraq.[1062] The resulting U.S. sanctions hurt the Syrian economy.[1063] In addition, the 2005 death of Lebanese Prime Minister Rafiq Hariri was blamed on Syria. The Hariri incident damaged trade relations between Syria and the European Union.[1064] Syria then strengthened its trade relationships with China, Iran, Turkey, and the Gulf States as the country opened itself up further to economic liberalization.[1065] These changes, however, increased the economic gap between Syria's rich and poor.[1066] Meanwhile, Syria continued to use its "resistance" to Israel and opposition to the United States to bolster domestic support for the Syrian government despite "broad dissatisfaction with economic conditions, some

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[1059] Director of National Intelligence, "Annual Threat Assessment of the Director of National Intelligence, 2007," 7.

[1060] Director of National Intelligence, "Annual Threat Assessment of the Intelligence Community for the House Permanent Select Committee on Intelligence, 2008," 25.

[1061] Isabel Kershner, "Secret Israel-Syria Peace Talks Involved Golan Heights Exit," *New York Times*, October 12, 2012, http://www.nytimes.com/2012/10/13/world/middleeast/secret-israel-syria-peace-talks-involved-golan-heights-exit.html.

[1062] Hinnebusch, "Syria: From 'Authoritarian Upgrading' to Revolution?," 100.

[1063] Ibid.

[1064] Ibid.

[1065] Ibid.

[1066] Ibid., 102.

disappointment at the lack of political reforms, and quiet resentment by some Sunnis at domination by the Alawi minority."[1067]

In addition, Syria's lack of border security with Iraq led to Islamist groups using Syria as a safe haven. The U.S. intelligence community noted that Syria served as the main transit point for foreign fighters traveling to Iraq.[1068] Syria turned a blind eye to these groups crossing its border to travel back and forth to Iraq to fight against the military forces of the United States and its allies. Al-Qaeda in Iraq especially benefited from this sanctuary and freedom of movement.[1069] These armed Islamist groups eventually turned against Syria during the Arab Uprising.

Arab Uprising protests began in Syria in March 2011. Assad was not sympathetic to the protesters' grievances, such as economic concerns, and responded with a show of force. Hinnebusch attributed the initiation of the uprising to overthrow the Assad regime to the government's violent suppression of peaceful protest.[1070] Furthermore, Hinnebusch assessed that the Sunni protesters in Syria were encouraged by similar uprisings in the region along with funding from Saudi Arabia and the exiled Muslim Brotherhood.[1071] In November 2011, the Arab League suspended Syria's membership due to its treatment of protesters.

Al-Qaeda in Iraq leader Abu Bakr al-Baghdadi sent Abu Mohammed al-Julani to Syria in 2011 to form jihadi groups resulting in the creation of an Al-Qaeda branch in Syria—the Al-Nusra Front.[1072] By 2012, Islamist Salafi groups seized on the turmoil in Syria and turned their networks developed during the fight against the United States and

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[1067] Director of National Intelligence, "Annual Threat Assessment of the Intelligence Community for the Senate Select Committee on Intelligence, 2009," 13.

[1068] Ibid., 14.

[1069] Creighton A. Mullins, "Syria and the Rise of Radical Islamist Groups" (Naval Postgraduate School, 2015), 75, http://hdl.handle.net/10945/45231.

[1070] Hinnebusch, "Syria: From 'Authoritarian Upgrading' to Revolution?," 106.

[1071] Ibid., 107.

[1072] Fawaz A. Gerges, "The Rise of IS—And How to Beat It," *BBC News*, January 12, 2015, sec. Middle East, http://www.bbc.com/news/world-middle-east-30681224.

its allies in Iraq against the Syrian regime.[1073] Glenn Robinson noted "many of the fighters currently battling the Syrian regime honed their guerrilla skills in Iraq, learning urban combat techniques fighting Americans in Iraq from 2003 to 2007. Those who were not killed in Iraq made their way back to Syria (the largest entry point for foreign jihadis entering Iraq during that war), and have taken up arms against their own regime."[1074]

In 2013, the Islamic State in Iraq and the Levant was formed in Syria. As Gerges explains,

> Baghdadi called for an Islamic State in Iraq and the Levant, which would see the merging of AQI and al-Nusra. Julani rejected the merger, a move backed by Al-Qaeda's overall leader, Ayman al-Zawahiri, to whom Julani pledged allegiance. An intra-jihadist war between IS and al-Nusra killed thousands of skilled fighters and exposed a fierce power struggle between Baghdadi and his former mentor—Zawahiri. For now, Islamic State has taken operational leadership of the global jihadist movement by default, eclipsing its parent organization.[1075]

The conflict showed no signs of ending quickly. The U.S. intelligence community noted in early 2012 that both sides in the conflict had been uncompromising on whether Bashar al-Assad should leave or remain as president.[1076] Further, the U.S. intelligence community assessed that "with Iran and Hezbollah backing the Assad regime, and the Gulf Cooperation Council states and Turkey actively opposing it," the conflict had become regional.[1077] On an international level, the United States, France, and Britain pushed for the UN Security Council to take action, but China and Russia obstructed their efforts.[1078] Russia was also aiding the Assad regime directly.[1079]

[1073] Mullins, "Syria and the Rise of Radical Islamist Groups," 78–82.

[1074] Glenn E. Robinson, "Don't Let the Syrian Rebels Win," *Foreign Policy* (blog), December 10, 2012, https://foreignpolicy.com/2012/12/10/dont-let-the-syrian-rebels-win/.

[1075] Gerges, "The Rise of IS—And How to Beat It."

[1076] Director of National Intelligence, "Unclassified Statement for the Record on the Worldwide Threat Assessment of the U.S. Intelligence Community for the Senate Select Committee on Intelligence, 2012," 16.

[1077] Ryan, "The New Arab Cold War and the Struggle for Syria."

[1078] Ibid.

[1079] Glenn E. Robinson, "Syria's Long Civil War," *Current History*, December 2012, 334.

As of early 2013, neither side had been able to make determinative progress in the conflict. Furthermore, the country had begun to fall apart. The U.S. intelligence community reported to Congress that an estimated 700,000 Syrians had left the country and 2.5 million Syrians were internally displaced and compounding the situation the country's economy had suffered greatly due to the sanctions and conflict.[1080] In fact, in 2012, the economy reduced by 10 to 15 percent, causing the Syrian government to focus on security expenses rather than public goods like healthcare, food, and education.[1081] Salloukh concluded that "Syria's swift transformation from a one-time regional player, commanding substantial influence in its immediate security environment, into terrain for geopolitical battles is one of the major geopolitical consequences of the Arab uprisings."[1082]

b. Nuclear Program

In the midst of this regional conflict, Syria had begun building a secret nuclear reactor. Throughout the early 2000s, North Korea helped Syria to build a covert reactor at Dair Alzour. The U.S. intelligence community noted that as of 2005 information seemed to indicate that North Korea was working with Syria on the endeavor.[1083] Conducive to hosting a nuclear reactor, the IAEA reported that the site had "a relatively stable geological platform on which to construct a heavy building, low population density in the area, close proximity to a river for the supply of cooling water, and the availability of services, including water and electricity."[1084] The U.S. intelligence community assessed that North Korea helped Syria with the reactor because it looked like the plutonium

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[1080] Director of National Intelligence, "Statement for the Record, Worldwide Threat Assessment of the U.S. Intelligence Community for the Senate Select Committee on Intelligence, 2013," 15.

[1081] Ibid.

[1082] Salloukh, "The Arab Uprisings and the Geopolitics of the Middle East," 42.

[1083] Office of the Director of National Intelligence, "Background Briefing with Senior U.S. Officials on Syria's Covert Nuclear Reactor and North Korea's Involvement," 2.

[1084] International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement in the Syrian Arab Republic," May 24, 2011, 6, https://www.iaea.org/sites/default/files/gov2011-30.pdf.

power reactor at Yongbyon and utilized technology like that of North Korea.[1085] Further, Washington asserted that North Korea assisted Syria with its nuclear program in return for financial remuneration.[1086]

U.S. intelligence did not identify the facility until the 2005 to 2006 timeframe.[1087] It had noticed shipments occurring from North Korea to Syria in 2006, likely to the site.[1088] By spring 2007, it became clear that Syria had begun building a nuclear reactor.[1089] The construction, which had begun around 2001, was finished by summer of 2007.[1090] The reactor was nearly operational by September 2007, but it had not been loaded with uranium fuel.[1091] The reactor's thermal power may have been 25 MW or more, according to the IAEA.[1092] The U.S. intelligence community noted that the reactor had no power lines or switching facilities for electricity production and was not really compatible with a research program.[1093] Also, in 2007, Syria publicly announced that the country might pursue a nuclear power program for electricity and desalination.[1094]

Prior to bombing the covert facility, Israel coordinated policy with the United States. Former U.S. President George W. Bush wrote in his memoirs that he received a call from Israeli Prime Minister Ehud Olmert asking him to bomb the Syrian facility.[1095]

[1085] Office of the Director of National Intelligence, "Background Briefing with Senior U.S. Officials on Syria's Covert Nuclear Reactor and North Korea's Involvement," 3.

[1086] Ibid., 13.

[1087] Ibid., 2.

[1088] Ibid., 3.

[1089] Ibid., 1.

[1090] Ibid., 1, 3.

[1091] Ibid.

[1092] International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement in the Syrian Arab Republic," May 24, 2011, 5.

[1093] Office of the Director of National Intelligence, "Background Briefing with Senior U.S. Officials on Syria's Covert Nuclear Reactor and North Korea's Involvement," 2, 3.

[1094] International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran.*, 78–79.

[1095] Bush, *Decision Points*, 421.

According to Bush, he was presented with three options by U.S. security officials: 1) a bombing attack on the facility as requested by Israel; 2) a covert raid that would destroy the building and entail U.S. personnel on the ground; or 3) a public denouncement of the nuclear reactor with allies, with a threat for military action if Syria did not close it.[1096] Further, the U.S. intelligence community was not able to verify the location of a site to convert plutonium into a form suitable for a weapon.[1097] Given this missing piece of information confirming that Syria had a weapons program, Bush informed Olmert that he could not conduct the raid and would pursue a diplomatic response initially.[1098] Olmert expressed his disappointment stating that a nuclear weapons program in Syria was an "existential" threat to Israel.[1099] Subsequently, the Israeli Air Force bombed and destroyed the reactor in a secret raid on September 6, 2007, according to Office of the U.S. Director of National Intelligence information.[1100]

U.S. intelligence noted that Israel's attack damaged the facility beyond repair and Syria destroyed the rest of the building.[1101] The IAEA reported that satellite imagery taken on October 24, 2007, showed extensive clearing and leveling had taken place at the site.[1102] According to U.S. intelligence, Syria sought "to destroy the ruined reactor building and to remove all potentially incriminating nuclear-related equipment and structures."[1103] In addition, Washington reported that, after the bombing of the site, a

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[1096] Ibid.

[1097] Ibid.

[1098] Ibid.

[1099] Ibid.

[1100] Office of the Director of National Intelligence, "Background Briefing with Senior U.S. Officials on Syria's Covert Nuclear Reactor and North Korea's Involvement," 3.

[1101] Office of the Director of National Intelligence, 6.

[1102] International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement in the Syrian Arab Republic," November 19, 2008, 4, https://www.iaea.org/sites/default/files/gov2008-60.pdf.

[1103] Office of the Director of National Intelligence, "Background Briefing with Senior U.S. Officials on Syria's Covert Nuclear Reactor and North Korea's Involvement," 3.

senior North Korean delegation traveled to Syria and met with Syrian officials working on the covert project.[1104]

Syria allowed the IAEA to access the destroyed facility following the attack. In 2008, Syria granted complete site access to the IAEA. The IAEA visited the site and Syrian officials reiterated that the location was not a military site with a nuclear purpose.[1105] Furthermore, Syria took the position that "the unreliable and insufficient electricity supplies in the area, the limited availability of human resources in Syria and the unavailability of large quantities of treated water" made a nuclear endeavor impossible.[1106] The IAEA reported, however, that the building's "containment structure appears to have been similar in dimension and layout to that required for a biological shield for nuclear reactors, and the overall size of the building was sufficient to house the equipment needed for a nuclear reactor of the type alleged."[1107] The agency assessed that "the pumping capacity" was "adequate for a reactor of the size referred to in the allegation" and there was "sufficient electrical capacity to operate the pumping system."[1108] Finally, laboratory analysis "revealed a significant number of natural uranium particles" that were "anthropogenic, i.e., that the material was produced as a result of chemical processing" at the site.[1109]

Syria was less than cooperative in providing additional information to the IAEA. As of May 2008, Syria had not provided the IAEA with requested documentation on the specifics of the bombed building nor granted permission to visit three other sites the IAEA expressed interest in visiting.[1110] Separately, additional anthropogenic uranium

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[1104] Ibid., 5.

[1105] International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement in the Syrian Arab Republic," November 19, 2008, 2.

[1106] Ibid.

[1107] Ibid., 3.

[1108] Ibid.

[1109] Ibid.

[1110] Ibid., 4.

particles were found in 2008 and 2009 at Syria's Miniature Neutron Source Reactor.[1111] In November 2009, Syria explained that the particles were from "previously unreported activities performed at the Miniature Neutron Source Reactor related to the preparation of tens of grams of uranyl nitrate using yellowcake" produced at the Homs Phosphoric Acid Pilot Plant.[1112] Also, in March 2010, the IAEA found a small, undeclared amount of uranyl nitrate at the Miniature Neutron Source Reactor.[1113] After obtaining additional information from Syria, the IAEA reported in 2011 that Syria's statements about the particles found at Miniature Neutron Source Reactor were "not inconsistent with the Agency's findings."[1114]

The IAEA's findings in a May 2011 report seemed to refute Syria's claims regarding the benign nature of the covert project. In May 2011, the IAEA reported that

> information subsequently provided to the Agency further alleged that the reactor was a gas cooled graphite moderated reactor, that it was not configured to produce electricity, that it had been built with the assistance of the Democratic People's Republic of Korea, and that there were three other locations in Syria that were functionally related to the Dair Alzour site.[1115]

The IAEA noted the similarities between the destroyed building and the dimensions of North Korea's reactor at Yongbyon.[1116] In its May 2011 report, however, the Agency revealed the following:

- features of the destroyed building are comparable to those of gas cooled graphite moderated reactors of the type and size alleged;
- prior to the bombing, the configuration of the infrastructure at the site, including its connections for cooling and treated water, was able to

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[1111] International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement in the Syrian Arab Republic," May 24, 2011, 7.

[1112] Ibid.

[1113] Ibid., 8.

[1114] Ibid.

[1115] Ibid., 1.

[1116] Ibid., 3.

support the operation of such a reactor and was not consistent with Syria's claims regarding the purpose of the infrastructure; in addition, a number of other features of the site add to its suitability for the construction and operation of a nuclear reactor;

- analysis of samples from the site indicates a connection to nuclear related activities; and
- the features of the destroyed building and the site could not have served the purpose claimed by Syria.[1117]

The IAEA finally concluded that the building at Dair Alzour "was very likely a nuclear reactor and should have been declared" to the IAEA, and it found Syria non-compliant with its NPT obligations.[1118] In June, the IAEA adopted a resolution finding Syria non-compliant with its Safeguards Agreement.[1119]

As the country descended into conflict, IAEA access in Syria became limited. In August 2013, the IAEA noted that additional inspections could not take place due to Syria's poor security situation.[1120] Questions lingered, however, regarding a possible undeclared stockpile of uranium that would have been used to fuel the destroyed reactor at Dair Alzour.[1121]

In terms of delivery systems, China, North Korea, Iran, and possibly Russia aided Syria with its missile program, according to the Nuclear Threat Initiative.[1122] For example, Iran provided Syria with the M-600 solid propellant missile in the mid-

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[1117] Ibid.

[1118] Ibid., 7.

[1119] International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement in the Syrian Arab Republic," August 28, 2013, 2, http://isis-online.org/uploads/isis-reports/documents/gov2013-41.pdf.

[1120] Ibid., 4.

[1121] James Blitz, "Fears Grow over Syria Uranium Stockpile," *Financial Times*, January 8, 2013, https://www.ft.com/content/a450b660-5998-11e2-88a1-00144feab49a.

[1122] "Profile for Syria—Missile."

2000s.[1123] As of early 2010, the U.S. intelligence community noted that Syria had "an active missile program, with some missiles that can reach 700 kilometers," likely a reference to the Scud-D.[1124] Finally, Syrian opposition forces succeeded in taking the Dair Alzour facility in February 2013 and may have captured a Syrian Scud-C missile stored there.[1125]

c. Nuclear Trends

By the end of 2013, while Syria maintained an active ballistic missile program, there was no indication that it was on its way to acquiring fissile material or a nuclear warhead. Its greatest advances were made before the 2007 bombing of its covert nuclear facility, if, as the various suspicious factors seemed to indicate, the purpose of the covert facility was to produce fissile material. Overall, there was a decrease in Syria's nuclear capabilities over the period due to Israel's attack on its covert facility.

What drove Syria's nuclear behavior? In the regional context, Syria was a small state surrounded by large threats. It sought to play a larger role in regional politics than its economic and military power would allow. Ellen Laipson wrote that Syria's program should be seen in the context of "the enduring struggle to find a just solution to the Arab-Israeli conflict and the need to balance Syria's pride and self-image with the fact that it is surrounded by a number of larger and more powerful states."[1126]

The puzzle remains why Syria did not retaliate in any way or seek to rebuild after Israel's attack on its program. Syria's regime believed it could benefit from a nuclear program; however, it opted not to retaliate or rebuild when its program was destroyed. Neither did Iran defend Syria. The muted response from Syria may have had to do with two considerations. The first was the presence of the U.S.-led coalition in neighboring

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[1123] Ibid.

[1124] Director of National Intelligence, "Annual Threat Assessment of the U.S. Intelligence Community for the Senate Select Committee on Intelligence, 2010," 26.

[1125] "Profile for Syria—Missile."

[1126] Ellen Laipson, "Syria: Can the Myth Be Maintained Without Nukes?" in *The Nuclear Tipping Point: Why States Reconsider Their Nuclear Choices*, ed. Kurt M. Campbell, Robert J. Einhorn, and Mitchell B. Reiss (Washington, DC: Brookings Institution Press, 2004), 84.

Iraq. Furthermore, based on the memoirs of President Bush, it seemed the United States might have been more comfortable making a decision to attack the Syrian facility with additional information. The United States remained cautious given the results of the 2004 Duelfer Report on Iraq's nuclear history. Syria likely realized it had few good options. The second was that there seemed to be tacit agreement among the great powers that a covert nuclear reactor had no place in the region; the lack of an international response to the 2007 attack demonstrated the strength of that consensus.

7. Turkey

Turkey began to take a larger role in regional political affairs during this time period. It also confronted various regional threats. Turkey continued to deal with the Kurdistan Workers' Party insurgency—its greatest security threat. After the Arab Uprising, it also had to confront the challenges of the conflict in Syria. The conflict pitted Turkey against the Syrian regime as it stood against empowered Syrian Kurds and supported Islamist parties in the region, such as the Muslim Brotherhood in Egypt. Like other regional states, Turkey sought to advance its nuclear energy program. While Turkey made progress establishing the legal framework for a nuclear power program along with nuclear cooperation agreements, by 2013, it had not broken ground for a nuclear power plant.

a. Political Context

During this time period, Turkey expanded ties with the Middle East, focusing less on Europe.[1127] Turkey and Egypt signed a free trade agreement in 2005 and discussed a gas pipeline. While Turkey and Syria did not traditionally have strong relations, these improved between 2009 and 2010, with an eye to bolstering trade.[1128] Economic interests dominated Turkey's relationship with Saudi Arabia and the United Arab

[1127] Crystal A. Ennis and Bessma Momani, "Shaping the Middle East in the Midst of the Arab Uprisings: Turkish and Saudi Foreign Policy Strategies," *Third World Quarterly* 34, no. 6 (January 1, 2013): 1129, https://doi.org/10.2307/42002179.

[1128] Andrea Bank and Roy Karadag, "The 'Ankara Moment': The Politics of Turkey's Regional Power in the Middle East, 2007–11," *Third World Quarterly* 34, no. 2 (January 1, 2013): 296, https://doi.org/10.2307/42002123.

Emirates.[1129] Turkey also maintained active trade relationships with both Libya and Iran.[1130] Further, Turkey imported natural gas from Iran and citizens from Iran visited Turkey and vice-versa resulting in a strong tourist industry. Also, both countries shared concerns about border security due to the Kurdish issue. Iran was less than pleased, however, with the installation of a North Atlantic Treaty Organization missile defense facility in Turkey in September 2011.

In Iraq, Turkey improved its relationship with the Kurds, but at the same time experienced friction in its relationship with Baghdad. For example, in October 2008, Kurdistan Regional Government President Barzani met with Turkish officials furthering relations between the Kurdistan Regional Government and Turkey.[1131] This developing relationship at times concerned the Iraqi government. As of early 2013, Turkey continued to experience a strained relationship with the Iraqi government in Baghdad. Iraqi leadership was upset that Turkey had bypassed the government in Baghdad to open up a political and trade relationship directly with the Kurdistan Regional Government.[1132]

Turkey historically enjoyed good relations with Israel, but experienced several downturns during this time period. Relations became strained with Israel over the visits of Hamas Leader Khaled Mashal to Turkey, which began in 2006. Tensions arose again during the 2008 to 2009 Gaza Conflict as Turkey sided with Hamas. Then, in 2010, Israel launched an attack against a Turkish ship carrying aid for the Palestinians. The ship's voyage sought to break an Israeli blockade against the Hamas-ruled Palestinian territories with the purpose of preventing weapons shipments to Hamas. The attack resulted in the deaths of nine Turks. Consequently, Turkey and Israel severed relations. In September 2012, President Recep Tayyip Erdogan expressed three conditions for the normalization of relations. They included a public apology by Israel for the incident, compensation for

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[1129] Ibid., 297.

[1130] Ibid., 296.

[1131] Director of National Intelligence, "Annual Threat Assessment of the Intelligence Community for the Senate Select Committee on Intelligence, 2009," 16.

[1132] Director of National Intelligence, "Statement for the Record, Worldwide Threat Assessment of the U.S. Intelligence Community for the Senate Select Committee on Intelligence, 2013," 29.

the victims' families, and an end to the Gaza blockade.[1133] Israel did not comply with these demands and relations between the two countries remained icy.

A number of Turkey's regional relationships shifted after the 2011 Arab Uprisings. Turkey consistently sided with Islamist parties, such as the Muslim Brotherhood. During the uprising in Egypt, Turkey criticized Mubarak and supported the protesters.[1134] Turkey immediately recognized the Muslim Brotherhood and their presidential candidate Morsi when the party came to power in 2012. After Morsi was removed from power in 2013, the relationship took a downturn. Turkey was more reticent about intervention in Libya due to its economic interests in the country and further outside interference in the region after the 2003 invasion of Iraq.[1135]

Turkey turned against the Assad government in Syria in August 2011 to support the Syrian opposition. Howeve,r Crystal Ennis and Bessma Momani noted that "Turkey's support for the Syrian opposition was a principled one, as Turkish economic investments in Syria and its relationship with the Assad government had been strong."[1136] In support of the opposition, Turkey allowed the Syrian National Council to base its headquarters in the country until late 2012 when the group transferred to Cairo.[1137] Also, Turkey supported a no-fly zone in Syria. In 2012, Syria shot down a Turkish fighter jet. Turkey responded by taking the incident to the North Atlantic Treaty Organization, which in turn condemned Syria's actions.

On the domestic front, Turkey's most significant domestic issue continued to be the Kurdistan Workers' Party insurgency. As of early 2008, the Kurdistan Workers' Party maintained around 1,000 to 2,000 fighters in Turkey, 3,000 to 3,500 fighters in northern

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[1133] Ibid.

[1134] Ennis and Momani, "Shaping the Middle East in the Midst of the Arab Uprisings: Turkish and Saudi Foreign Policy Strategies," 1134.

[1135] Ibid., 1135.

[1136] Ibid., 1136.

[1137] Ibid.

Iraq, and a couple of hundred in Iran and Syria.[1138] In October 2011, with Turkey occupied in Syria, the insurgent group carried out one of its deadliest attacks against Turkish security forces.[1139] Erdogan responded by increasing operations against the Kurdistan Workers' Party.[1140] The combination of the security issues resulting from the Syria conflict and the domestic insurgency presented a significant challenge to the Turkish government. For example, the conflict in Syria led to a greater threat from Islamic extremists in Turkey—Turkey served as the primary gateway for foreign fighters to travel to Syria.[1141] Furthermore, any gains by the Syrian Kurds in Syria contributed to Turkish fears of separatism by the Turkish Kurds.[1142] In early 2013, the U.S. intelligence community reported that the Kurdistan Workers' Party-related violence in Turkey had risen to its worst level in 10 years.[1143] Erdogan responded by pursuing a peace deal with the insurgents during 2013.

Finally, signs of domestic instability appeared at the end of the time period. Erdogan's challenges were amplified when allegations of corruption were lodged against him in 2013 by affiliates of Fethullah Gulen, an influential Muslim cleric.[1144]

Turkey's regional influence increased over this time period. Turkey's weight as a regional political and economic player influenced outcomes. It was not as dwarfed by an external power as in the previous time periods. Roy Kadarag and Andrea Bank surmise that it was "the immense loss of U.S. influence in the Middle East, especially after the

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[1138] Director of National Intelligence, "Annual Threat Assessment of the Intelligence Community for the House Permanent Select Committee on Intelligence, 2008," 21.

[1139] Director of National Intelligence, "Unclassified Statement for the Record on the Worldwide Threat Assessment of the U.S. Intelligence Community for the Senate Select Committee on Intelligence, 2012," 23.

[1140] Ibid.

[1141] Director of National Intelligence, "Statement for the Record, Worldwide Threat Assessment of the U.S. Intelligence Community for the Senate Select Committee on Intelligence, 2014," 27.

[1142] Director of National Intelligence, "Statement for the Record, Worldwide Threat Assessment of the U.S. Intelligence Community for the Senate Select Committee on Intelligence, 2013," 29.

[1143] Ibid.

[1144] Rasim Ozan Kutahyali, "Turkey's AKP-Gulen Conflict in Context," *Al-Monitor*, November 26, 2013, http://www.al-monitor.com/pulse/en/originals/2013/11/turkey-akp-gulen-conflict-power-state-control.html; Director of National Intelligence, "Statement for the Record, Worldwide Threat Assessment of the U.S. Intelligence Community for the Senate Select Committee on Intelligence, 2014," 27.

second Bush administration from 2005 to 2009, which has allowed the rise of influential regional players."[1145]

b. Nuclear Program

Turkey continued its long pursuit of nuclear power. Turkey's Justice and Development Party made a commitment when it came to power in 2002 to pursue nuclear power for the country. Turkey took up its nuclear power project again in 2004, conducting a feasibility study for plant locations. Turkey and the United States signed a nuclear cooperation agreement in June 2006, which went into force in 2008.[1146] In August 2006, Turkey announced it would install three nuclear reactors by 2015.[1147] Turkey's stated goal was "to meet growing energy requirements, reduce dependence on Russian natural gas and enable Turkey to export electricity to Europe."[1148] A bill was sent to the Turkish parliament in order to move the project forward by enabling the construction and operation of power facilities by both the private and public sectors.[1149] In 2007, the Turkish Atomic Energy Authority advised that reactors utilizing natural uranium or low enriched uranium could be constructed.[1150]

Turkey began looking for a supplier for its nuclear power plants. The country turned to Russia and signed an intergovernmental agreement in May 2010 for Rosatom to build its first plant at Akkuyu with four nuclear reactors.[1151] Russia would "build, own, and operate" the plant.[1152] The agreement was ratified by both parliaments in July. Kibaroglu noted that the agreement was criticized domestically, however, as it did not

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[1145] Bank and Karadag, "The 'Ankara Moment': The Politics of Turkey's Regional Power in the Middle East, 2007–11," 299.

[1146] Varnum, "Turkey in Transition," 252.

[1147] "Nuclear Power in Turkey," World Nuclear Association, October 2016, http://www.world-nuclear.org/information-library/country-profiles/countries-t-z/turkey.aspx.

[1148] International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran*, 65.

[1149] Ibid.

[1150] Ibid., 66.

[1151] Kibaroglu, "Lessons from Turkey's Long Quest for Nuclear Power," 162–63.

[1152] "Nuclear Power in Turkey."

advance Turkey's original goal of developing "indigenous scientific and technological advancement in the nuclear field."[1153]

The country continued to move forward working with international players in the field of nuclear power. Turkey signed nuclear cooperation agreements with South Korea and China in June 2010 and April 2012, respectively.[1154] In January 2011, Turkish energy official Metin Kilci noted that Turkey had the goal of 20 reactors operating by 2030.[1155] In May 2013, Ankara granted negotiating rights for a second plant with four nuclear reactors to Mitsubishi Heavy Industries-AREVA on the Black Sea at Sinop.[1156] Japan and Turkey signed the intergovernmental agreement in October 2013. In November 2013, the IAEA conducted a review in Turkey to determine the country's readiness for a nuclear energy program.[1157] The agency recommended that the government should finish "a national policy on nuclear energy, strengthening the regulatory body, and developing a national plan for human resource development."[1158]

As of late 2013, Turkey had several small research reactors and it continued to host tactical nuclear weapons due to its role in the North Atlantic Treaty Organization. Specifically, Turkey had two small research reactors, but only one functioning reactor. Turkey's nuclear reactor, the TR-2, was shut down during a refurbishment process that began in 2011.[1159] Construction had not yet begun on any nuclear reactors for its planned power plants. As of 2011, it hosted an estimated 60 to 70 tactical nuclear weapons at Incirlik Air Base.[1160] There were questions, however, regarding whether Turkey has maintained the operational capability to deliver the weapons or whether that task would be reserved for U.S. forces.

[1153] Kibaroglu, "Lessons from Turkey's Long Quest for Nuclear Power," 162–63.

[1154] "Nuclear Power in Turkey."

[1155] "Profile for Turkey."

[1156] Ibid.

[1157] "Nuclear Power in Turkey."

[1158] Ibid.

[1159] Research Reactor Database.

[1160] Norris and Kristensen, "U.S. Tactical Nuclear Weapons in Europe, 2011," 69.

Finally, in terms of delivery systems, the information examined here seemed to indicate that Turkey was focused primarily on acquiring a ballistic missile defense system during this period. In November 2013, Turkey asked the North Atlantic Treaty Organization to "supply PAC-3 batteries to defend against missiles and long-range artillery from Syria," especially Syria's Scud-D missiles with a range of 700 kilometers.[1161]

c. Nuclear Trends

During this time period, Turkey did not advance toward an indigenous nuclear weapons capability in terms of fissile material, a nuclear warhead, or a delivery vehicle. Turkey continued to express interest in developing nuclear power like other regional states. As of late 2013, Turkey's nuclear power program was less developed than that of the United Arab Emirates, but more developed than countries like Saudi Arabia. Turkey had signed agreements in the past to construct nuclear power plants, but none had come to fruition. It remained to be seen whether Turkey's agreements with Russia and Japan would produce a different result. Turkey made no indication that it might pursue a nuclear weapons program.

What drove Turkey's nuclear behavior? Turkey was under the North Atlantic Treaty Organization's nuclear umbrella. In the regional context, while turmoil from Syria and Iraq impacted the country, Turkey did not face a serious regional rival in the Middle East. If anything, its greatest threat emanated from a domestic conflict. Also, pursuit of a nuclear weapon would likely have jeopardized Turkey's relations with the North Atlantic Treaty Organization and the United States, the supplier of the tactical nuclear weapons on Turkey's soil. While Turkey possessed the economic and military capabilities to support a nuclear program, the country did not move toward nuclear proliferation for these reasons.

[1161] "Profile for Turkey."

8. United Arab Emirates

The United Arab Emirates made the most progress on its nuclear energy program of all the regional states that announced plans for nuclear power in the mid-2000s. By late 2013, construction had begun on the first power plant. But, the United Arab Emirates opted to forego the acquisition of a complete nuclear fuel cycle, joined numerous nonproliferation agreements and treaties, and did not seek to acquire a delivery vehicle. In short, while it moved forward on nuclear power, it further integrated itself into the nonproliferation regime.

a. Political Context

The United Arab Emirates continued to develop its military and economic power during this time period. It did so with the support of the United States, which guaranteed the United Arab Emirates' security and provided direct investment.[1162]

The United Arab Emirates maintained close ties with the other Gulf States, especially Saudi Arabia. The United Arab Emirates' relationship with Iraq also slowly improved. The United Arab Emirates appointed an ambassador to Iraq in 2008, thus reestablishing relations after the Second Gulf War. Iran and the United Arab Emirates continued to have extensive economic ties with a large Iranian expatriate population in the United Arab Emirates, particularly in Dubai. Nevertheless, the United Arab Emirates remained concerned about the Iranian nuclear program.

Finally, relations between the United Arab Emirates and Israel improved over this time period. Israel and the United Arab Emirates do not have formal relations with each other due to the unsettled Israeli-Palestinian issue. In 2009, however, Israel sought to build goodwill with the United Arab Emirates by backing its efforts to have the International Renewable Energy Agency based in Abu Dhabi.[1163] This gesture was well received by the United Arab Emirates. Since then, Israeli officials have visited the United

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[1162] Foley, *The Arab Gulf States*, 140.

[1163] Diaa Hadid, "Israel to Open Diplomatic Office in United Arab Emirates," *New York Times*, November 27, 2015, http://www.nytimes.com/2015/11/28/world/middleeast/israel-to-open-diplomatic-office-in-united-arab-emirates.html.

Arab Emirates to participate in International Renewable Energy Agency events, despite an official entry ban.[1164] The inaugural visit by an Israeli minister occurred in 2010 with the visit of former Infrastructure Minister Uzi Landau.[1165] Despite periodic disagreements between the two countries, the Emirati-Israeli relationship has been maintained over time due to agreement on issues of concern, such as the Iranian nuclear program.

Regional dynamics shifted for the United Arab Emirates at the onset of the Arab Uprising in 2011. Due to internal stability concerns, the United Arab Emirates strongly opposed Islamist groups, particularly the Muslim Brotherhood. A rift between the United Arab Emirates and Qatar emerged when the United Arab Emirates accused Qatar of sponsoring Islamist groups within the Gulf. Dubai's police chief "accused the Muslim Brotherhood of conspiring, with financial help from Qatar, to assume power in a number of Gulf countries."[1166] Relations with Egypt deteriorated when Morsi and the Muslim Brotherhood came to power there in 2012.[1167] Relations improved again after Morsi was removed in 2013 and the military returned to power. In Libya, the United Arab Emirates, along with Saudi Arabia and Qatar, supported anti-Qaddafi rebels.[1168] In Syria, the United Arab Emirates joined Saudi Arabia to side with the Syrian opposition and the United Arab Emirates closed its embassy in Syria with the onset of the Syrian Civil War. In Bahrain, Emirati troops assisted Saudi Arabia in supporting the ruling family in March 2011 when a Shia uprising occurred.

As of late 2013, the United Arab Emirates continued to play an important role in the Gulf and the region, especially as it assisted Saudi Arabia with its security efforts.

[1164] Hagar Shezaf and Rori Donaghy, "Israel Eyes Improved Ties with Gulf States after 'Foothold' Gained in UAE," Middle East Eye, January 18, 2016, http://www.middleeasteye.net/news/israel-eyes-improved-gulf-states-relationship-ties-flourish-uae-895004700.

[1165] Ibid.

[1166] Salloukh, "The Arab Uprisings and the Geopolitics of the Middle East," 44.

[1167] Giorgio Cafiero and Daniel Wagner, "How the Gulf Arab Rivalry Tore Libya Apart," *National Interest*, http://nationalinterest.org/feature/how-the-gulf-arab-rivalry-tore-libya-apart-14580; Andrea B. Rugh, *The Political Culture of Leadership in the United Arab Emirates* (New York: Palgrave Macmillan, 2010), 236.

[1168] Cafiero and Wagner, "How the Gulf Arab Rivalry Tore Libya Apart."

Generally, where Saudi Arabia could be found working to further its regional security agenda, the United Arab Emirates could be found there as well.

On the domestic front, the United Arab Emirates continued to advance significant building and investment projects, primarily in the two most powerful emirates—Abu Dhabi and Dubai. Abu Dhabi was known for its wealth, as it holds the majority of the country's oil reserves, and for being more conservative. Dubai was known as an international business hub and as being more liberal and extravagant. Furthermore, the two emirates saw one another as competitors. Andrea Rugh writes that this tension between the two emirates "was manifest during the economic problems in Dubai in 2009 to 2010. Due to their innate 'tribal' belief in the value of not showing off wealth except in measured ways, Abu Dhabi was very reluctant to bail Dubai out."[1169]

b. Nuclear Program

The United Arab Emirates expressed interest in nuclear power along with its fellow Gulf Cooperation Council members in 2006. In 2007, it participated in the Gulf Cooperation Council-sponsored IAEA feasibility study. It became apparent in 2008, however, that the United Arab Emirates would pursue nuclear power on its own terms. The country moved quickly to establish a nuclear energy program with assistance from third countries.[1170] A white paper released in April 2008 outlined the country's nuclear energy policy and its commitment to peaceful nuclear energy.[1171] The paper committed to: 1) "complete operational transparency," 2) pursuit of the "highest standards of non-proliferation," 3) adherence to "the highest standards of safety and security," 4) direct work with the IAEA, conforming to its standards, 5) development of nuclear power

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[1169] Rugh, *The Political Culture of Leadership in the United Arab Emirates*, 236.

[1170] Mari Luomi, "The Economic and Prestige Aspects of Abu Dhabi's Nuclear Program," in *Nuclear Question in the Middle East*, ed. Mehran Kamrava, First Edition (New York: Oxford University Press, 2012), 128.

[1171] "Profile for United Arab Emirates."

capability assisted by foreign governments, firms, and expert organizations, and 6) focus on long-term sustainability in the nuclear power program.[1172]

To guide the process of establishing this program, the United Arab Emirates founded the Nuclear Energy Program Implementation Organization and the Emirates Nuclear Energy Corporation.[1173]

The United Arab Emirates solicited bids for its first nuclear reactors in June 2008.[1174] It signed a nuclear cooperation agreement with the United States in January 2009. The agreement came into force in December and was hailed as the "gold standard" for nuclear agreements. This signified that the agreement prohibited enrichment and reprocessing.[1175] In April, the United Arab Emirates signed the Additional Protocol for its Safeguards Agreement. In August, the country entered into the IAEA Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management and the IAEA Convention on Nuclear Safety. In October, the United Arab Emirates approved legislation "banning domestic enrichment and reprocessing."[1176] In December, the Emirates Nuclear Energy Corporation was officially launched. Also in December, the United Arab Emirates signed a deal with South Korea's KEPCO to build four nuclear reactors. KEPCO was chosen as the most cost-effective offer with the most reliable schedule.[1177] The stated timeline for the project was to have all four reactors operating by 2020.[1178] In 2010, the Emirates Nuclear Energy Corporation established a Nuclear Safety Review Board and an International Advisory

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[1172] Government of the United Arab Emirates, "Policy of the United Arab Emirates on the Evaluation and Potential Development of Peaceful Nuclear Energy," April 20, 2008, 1, https://www.fanr.gov.ae/En/Documents/whitepaper.pdf.

[1173] Ibid., 2.

[1174] Luomi, "The Economic and Prestige Aspects of Abu Dhabi's Nuclear Program," 144.

[1175] "Profile for United Arab Emirates."

[1176] Luomi, "The Economic and Prestige Aspects of Abu Dhabi's Nuclear Program," 144.

[1177] Ibid., 141.

[1178] "Nuclear Power in the United Arab Emirates," World Nuclear Association, October 2016, http://www.world-nuclear.org/information-library/country-profiles/countries-t-z/united-arab-emirates.aspx.

Board. Former IAEA head Hans Blix chaired the latter organization. The groundbreaking for the first reactor occurred in March 2011.

The nuclear power project progressed more slowly than originally planned, however. Industry experts highlighted a delay on nuclear power plans in the United Arab Emirates after the nuclear tragedy at the Fukushima plant as the country revised its plans and added additional safety measures.[1179]

From 2004 to 2013, the United Arab Emirates signed a number of nuclear cooperation agreements in addition to its agreement with the United States. It signed a memorandum of understanding with the United Kingdom in 2008.[1180] It signed an agreement with France in 2008, South Korea in 2009, Canada and Russia in 2012, and Argentina and Japan in 2013.[1181]

The speed at which the United Arab Emirates nuclear energy program was implemented astonished nuclear experts. The World Nuclear Association observed that

> before the UAE implemented its nuclear power program from 2008, it was considered that such new programs would be developed sequentially and slowly. The UAE demonstrated that it is possible to proceed faster by doing a number of things in parallel, by using experienced expatriates initially and transitioning to local expertise over time, and by committing to an experienced reactor and power plant builder with a track record of on-time and on-budget performance.[1182]

Beyond the efficient logistics behind the establishment of the United Arab Emirates' nuclear energy program, there was a domestic side to the United Arab Emirates' efforts. First, Mari Luomi notes that "there is no such thing as the United Arab Emirates' nuclear program. Despite cooperation agreements, regulatory structures and nuclear diplomacy being handled at the federal level, the nuclear program was initiated

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[1179] Background discussions with international energy company executives responsible for the Middle East region.

[1180] "Nuclear Power in the United Arab Emirates."

[1181] Ibid.

[1182] Ibid.

by Abu Dhabi and is set to remain so."[1183] Abu Dhabi is the richest and largest emirate. It had the economic means to roll out the program quickly and proficiently with the assistance of foreign expertise. Further, the nuclear energy program served as an example of the United Arab Emirates' ambitions. For a country that, as of March 2013, prided itself on holding 110 world records, the country's nuclear energy program could serve as another source of pride.[1184]

The United Arab Emirates sits directly across the Persian Gulf from Iran. While the United Arab Emirates had the financial means to pursue a nuclear weapons program as a deterrent, the country had focused exclusively on NPT-sanctioned peaceful uses of nuclear technology. The country enjoyed a close relationship with the great powers—particularly the United States and the United Kingdom due to historic ties. The United Arab Emirates has used its good standing in the international community to quickly and easily establish its nuclear energy infrastructure. It seemed to be the first among the region's states that committed to the pursuit of nuclear energy programs in the mid-2000s to be able to reach this goal.

In terms of delivery systems, the United Arab Emirates sought to acquire a missile defense system during this period. The U.S. military's Defense Cooperation Security Agency reported in November 2012 it had advised Congress that the United Arab Emirates had requested 48 Terminal High-Altitude Area Defense missiles.[1185] The agency also noted that the missile defense system would help thwart regional threats and reduce the country's reliance on the U.S. military.[1186] Iran's previously discussed missile capabilities would seem to present a regional threat that this missile defense system could help mitigate.

[1183] Luomi, "The Economic and Prestige Aspects of Abu Dhabi's Nuclear Program," 127.

[1184] Martin Croucher, "Guinness World Record—Bids Soaring in UAE," *The National*, March 3, 2013, http://www.thenational.ae/news/uae-news/guinness-world-record-bids-soaring-in-uae; Luomi, "The Economic and Prestige Aspects of Abu Dhabi's Nuclear Program."

[1185] "United Arab Emirates—Terminal High Altitude Area Defense System Missiles (THAAD)," News Release (Washington, DC: Defense Security Cooperation Agency, U.S. Military, November 5, 2012), http://www.dsca.mil/major-arms-sales/united-arab-emirates-terminal-high-altitude-area-defense-system-missiles-thaad.

[1186] "United Arab Emirates—Terminal High Altitude Area Defense System Missiles (THAAD)."

c. Nuclear Trends

The United Arab Emirates' nuclear program falls short when measured against the definition of nuclear proliferation, progress toward weapons-relevant nuclear capabilities. The country has banned domestic enrichment and reprocessing and thus will not complete the nuclear fuel cycle. During this time period, the United Arab Emirates did not take steps toward acquiring fissile material, a nuclear warhead, or a delivery vehicle. The comparable ease with which the United Arab Emirates was able to establish a nuclear power program, and do so without international concern due to its "gold standard" nuclear agreement with the United States demonstrated a path for future seekers of nuclear energy to follow. Furthermore, the United Arab Emirates may have been able to alleviate some of its concerns regarding Iran's nuclear program by working to acquire a missile defense system.

What drove the United Arab Emirates' nuclear behavior? In the regional context, the United Arab Emirates remained concerned about the threat from Iran, a rising power in the Middle East. Nevertheless, the Emirates did not advance a nuclear weapons program despite having the finances to purchase such a capability. On the international level, the United Arab Emirates had long benefited from a close relationship with the United Kingdom and the United States. It carefully constructed a legal and regulatory framework that would allay worries the great powers might have in terms of the direction of its program. Given its financial resources, the United Arab Emirates could move quickly and efficiently to establish such a program. The United Arab Emirates' program perhaps exemplifies the U.S. preference for a third country's nuclear energy program.

9. Analysis

Two countries in the region were nuclear proliferators from 2004 to 2013—Syria and Iran. With North Korea's aid, Syria completed a secret nuclear reactor in 2007. It was nearly operational when Israel destroyed the facility. While Iran ended its coordinated weapons program by 2004, it continued to build its enrichment and delivery systems. Furthermore, the IAEA reported that Iran had conducted computer modeling of a nuclear explosive device between 2005 and 2009. By 2010, however, the IAEA assessed that Iran

was no longer working on nuclear weapons. Finally, Iran entered into serious nuclear negotiations in 2013 with a P5+1 goal of preventing possible military applications of Iran's nuclear program.

Iraq and Libya, former outliers, stayed on the path of renouncing their nuclear programs and conforming to the standards of the nonproliferation regime. Also, numerous states in the region expressed interest in nuclear power in the mid-2000s, but by 2013, little progress had been made toward this ambition. The exception was the United Arab Emirates, which began construction of its first nuclear power plant in 2011. The country opted to legally ban domestic enrichment and reprocessing, however, eliminating the possibility that it could stockpile fissile material.

Thus, by the end of the time period, with the end of Syria's nuclear program, only Iran's program remained. Further, it seemed that Iran's nuclear weapons intentions had been constrained for the time being. No new efforts to launch a nuclear program were apparent in the region. What explains the overall decrease in regional nuclear proliferation, which is summarized in Table 3? Given the regional turmoil and a transition to a multipolar international system, it would have seemed likely that proliferation would have increased.

Table 3. Summary of Regional Nuclear Trends from 2004 through 2013

Egypt
No increase or decrease in nuclear proliferation.
Iran
Iran ended its coordinated military nuclear program in 2003. It sought to move forward with pieces of the program over the time period, such as computer modeling of a nuclear explosive device between 2005 and 2009. Iran came to the negotiating table in 2013 willing to consider halting progress on its program and to be monitored. This outcome was due to great power management and post-hegemonic cooperation.
Iraq
Iraq continued to decrease its nuclear capabilities.
Libya
Libya decreased its nuclear capabilities over the time period. It dismantled the nuclear program due to great power management.
Saudi Arabia
No increase or decrease in nuclear proliferation.
Syria
Syria's nascent nuclear program ended in 2007 when Israel bombed its covert nuclear reactor. This outcome was due to great power management.
Turkey
No increase or decrease in nuclear proliferation.
United Arab Emirates
No increase or decrease in nuclear proliferation.

B. VARIATIONS IN NUCLEAR PROLIFERATION BEHAVIOR: TESTING TWO THEORIES

Which theory better explains nuclear behavior during this third time period? The first hypothesis based on Kenneth Waltz's work is: *Regional nuclear proliferation should increase during the third time period as a transition to a multipolar international system occurs and regional powers play more prominent roles.* The second hypothesis based on Paul's work is: *Regional nuclear proliferation should increase during the third period due to a resurgence of regional conflict and rivalry. Proliferation is mitigated if a state receives security guarantees or finds a different deterrent.* Is there a causal link between the transition to a multipolar international system and an increase in nuclear proliferation

or a causal link between regional conflict and rivalry and an increase in nuclear proliferation? What drove the regional nuclear proliferation trend?

1. Testing Two Theories

The hypotheses suggested that nuclear proliferation would increase during this time period. Instead, it decreased. The nuclear histories explored here demonstrated that in a multipolar system the great powers motivated by self-interest worked to halt regional nuclear proliferation efforts. In addition, multilateral efforts by Germany, the United Kingdom, and France to find a diplomatic solution to the Iran nuclear crisis seemed to provide an example of post-hegemonic cooperation.

Following the Second Gulf War, the unipolar period with the United States as the sole superpower drew to an end and other great powers, such as China and Russia, rose to challenge the United States. Waltz warned of "the greater instability of a multipolar world."[1187] He noted that in a multipolar world, "the dangers are diffused, responsibilities unclear, and definition of vital interests easily obscured."[1188] This instability motivates states to safeguard their security. In the pursuit of security, nuclear weapons are viewed as the ultimate deterrent. It would thus stand to reason that nuclear proliferation would increase during this time period. The unlikely outcome here is that nuclear proliferation continued to decrease. The idea of linking decreased stability in a multipolar system with an increase in nuclear proliferation then becomes problematic as it does not take into account the mitigating factor of great power management of nuclear proliferation or the possibility of post-hegemonic cooperation in the context of the nonproliferation regime.

What role might the global nonproliferation regime have played in the decrease of regional nuclear proliferation? Robert Keohane in *After Hegemony: Cooperation and Discord in the World Political Economy* argued international regimes created by a hegemon can be valuable and lead to collaboration between states even after hegemonic

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[1187] Waltz, "The Stability of a Bipolar World," July 1, 1964, 906.

[1188] Ibid., 884.

decline.[1189] Self-interest is the driving force behind regime formation and a regime's most powerful members will shape it in ways that are important to those members.[1190] In regards to the nuclear nonproliferation regime, which I define as the global network of treaties, policies, agreements, and organizations designed to prevent and counter nuclear proliferation, the United States as a superpower played a principal role in establishing many aspects of the regime. U.S. hegemonic security leadership was key to reinforcing and strengthening the regime in the unipolar period. The components of the nonproliferation regime include the Nuclear Suppliers Group, the Missile Technology Control Regime, the Cooperative Threat Reduction program, and the Proliferation Security Initiative, among others, in addition to the traditional elements of the regime such as the NPT, the IAEA, and the Safeguards system.[1191] Furthermore, the United States required international cooperation to accomplish its goals. This regime facilitated cooperation around the issue of combatting nuclear proliferation, thereby contributing to the decrease in nuclear proliferation in the Middle East.

In the multipolar period, the nonproliferation regime continued to help facilitate cooperation to combat the spread of nuclear weapons. Furthermore, examples of post-hegemonic cooperation could be seen in the efforts of Germany, France, and the United Kingdom to negotiate an end to Iran's nuclear weapons program in the early 2000s. This signaled the possible persistence of the nonproliferation regime into the future beyond the great power status of the regime's principal founder. Cooperation against the spread of nuclear weapons occurred as new initiatives, agreements, and organizations have been added to the regime.[1192]

Regional nuclear proliferation in the Middle East did not increase from 2004 to 2013 despite the transition to a multipolar international system. While Iran and Syria sought to build covert nuclear capabilities during this time period, by 2013, Syria's

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[1189] Keohane, *After Hegemony*, 50.

[1190] Ibid., 63.

[1191] Jeffrey Knopf, "International Cooperation on Nonproliferation," in *International Cooperation on WMD Nonproliferation*, ed. Jeffrey Knopf (Athens, GA: University of Georgia Press, 2016), 1–2.

[1192] Ibid., 3.

program had ended and Iran's appeared to be constrained. Both of these outcomes supported U.S. and great power interests in the region. The historical record points to the effects of the vigorous sanctions regime pushed forward by the United States and the rising great powers as the reason for Iran's 2013 agreement to undertake serious negotiations. Like the cases of Iraq and Libya, it appeared to be a case of the United States in cooperation with other states making proliferation costly enough that Iran opted to relinquish its military program, at least for the time being.[1193] This was the continued result of great power management of regional nuclear proliferation. Nevertheless, the initial negotiations began due to the efforts of Germany, France, and the United Kingdom. The initiative was not directed by the United States nor was Iran a security threat to any of the three countries. This leads to the possibility that in this post-hegemonic period, cooperation to enforce standards of behavior delineated in the nonproliferation regime occurred.[1194] It began a crucial dialogue that the United States, Russia, and China later joined.

In regards to the Syrian nuclear program, U.S. President George W. Bush wrote in his memoirs that Israeli Prime Minister Ehud Olmert called him regarding the Syrian nuclear facility.[1195] This call seemed to indicate that Israel looked to the United States as an external manager to handle the issue.[1196] President Bush did not disagree that the issue should be addressed.[1197] Furthermore, there was no public information indicating that the United States and other great powers condemned Israel's actions. While there was no doubt of an ongoing regional rivalry between Syria and Israel, there was a stronger case to be made for the role of the United States as an external manager in the eventual outcome. This event still strongly fits into the narrative of external managers shaping regional nuclear proliferation trends.

[1193] Russell, "Introduction," 5.

[1194] Robert Keohane defines norms as "standards of behavior" in Keohane, *After Hegemony*, 57.

[1195] Bush, *Decision Points*, 421.

[1196] Ibid.

[1197] Ibid.

In addition, the only country that began to build a nuclear power reactor, the United Arab Emirates, decided to enact a ban on domestic enrichment and reprocessing. Also, the United Arab Emirates signed a nuclear cooperation agreement with the United States that similarly restricted enrichment and reprocessing. Thus, it would not acquire a supply of plutonium as a byproduct of the fuel cycle. The United Arab Emirates' program enjoyed support from allies such as the United States, the United Kingdom, and France. This was another area that the great powers influenced regional nuclear proliferation trends bolstered by the standards of behavior set forth by the nonproliferation regime.

Why does the alternate hypothesis from Paul's work not provide sufficient explanatory power? On balance, regional proliferation did not increase contrary to Paul's hypothesis. Regional competition reached a fevered pitch as the rivalry between Iran and Saudi Arabia, arguably a conflict dyad, continued unabated and Arab states competed against one another in the "new Arab Cold War." Conflict and instability increased throughout the region. By late 2013, Egypt, Libya, Iraq, and Syria were all dealing with significant domestic security challenges, the effects of which often spilled out into neighboring states. Turkey was also experiencing a peak in violence from the Kurdistan Workers' Party insurgency along with instability along its border with Syria. The only countries that remained relatively calm were the Gulf States. The increase in regional conflict and rivalry did not translate into an increase in nuclear proliferation because of ongoing great power external management of an issue, nonproliferation, that was deeply important to the United States and other great powers. The decrease also can be attributed to post-hegemonic cooperation to hold a NPT member accountable to the standards of the nonproliferation regime.

2. Analyzing T.V. Paul's Data

This section examines the data Paul uses to support his theory. Unfortunately, the dataset that Paul references in his study, the Correlates of War data on militarized interstate disputes, ends in 2010, while this chapter's time period ends in 2013. In addition, 2011 through 2013 proved to be a tumultuous time in the region's history. This chapter uses the data available through 2010 and draws conclusions with caveats. Also, it

relies more heavily on the other indicators referenced by Paul—economic interdependence and regional organization. Overall, however, the region can still be classified as a high-conflict zone as described by Paul.

a. Militarized Interstate Disputes

First, the number of militarized interstate disputes occurring between 2004 and 2010 in the region were as follows: Bahrain, 0; Egypt, 3; Iran, 21; Iraq, 10; Israel, 9; Jordan, 0; Kuwait, 0; Lebanon, 2; Libya, 0; Oman, 0; Qatar, 1; Saudi Arabia, 1; Syria, 6; Turkey, 10; United Arab Emirates, 1; and Yemen, 3.[1198] The leading states with militarized interstate disputes for this period were Iran, Iraq, and Turkey, with Israel close behind. Once again, there were a number of states with more than five militarized interstate disputes in a twenty-year period. Looking at the regional total, there was an average of nearly 10 militarized interstate disputes per year. For 1991 to 2003, there had been an average of nearly 13 militarized interstate disputes per year. Thus, there was a slight reduction in the average number of militarized interstate disputes per year from 2004 to 2010. Noticeably, this time span does not include the Arab Uprising. In terms of significant dyads, Iraq and Iran no longer continued to be rivals. Rather a rivalry emerged between Saudi Arabia and Iran.

b. Economic Interdependence

According to Paul, economic issues do not play a high-level role in interstate relations in zones of high conflict, like the Middle East.[1199] Economic interdependence is "measured in terms of trade among the regional states as a percentage of overall imports and exports."[1200] From 2004 to 2013, what was the nature of economic interdependence in the Middle East?

In order to assess the economic interdependence of the region in its entirety from 2004 to 2013, all regional states are included. They are Bahrain, Egypt, Iran, Iraq, Israel,

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[1198] Palmer et al., "The MID4 Data Set: Procedures, Coding Rules, and Description."

[1199] Paul, *Power versus Prudence*, 22.

[1200] Ibid., 20.

Jordan, Kuwait, Lebanon, Libya, Oman, Qatar, Saudi Arabia, Syria, Turkey, United Arab Emirates, and Yemen. This section examines regional trade data on import and export relationships between each state and the rest of the region, displayed in Figure 5 and Figure 6, using data from the International Monetary Fund.[1201] This percentage is acquired using the total U.S. dollar amount of trade between each state and the rest of the regional states and the total U.S. dollar amount of trade between each state and the whole world.

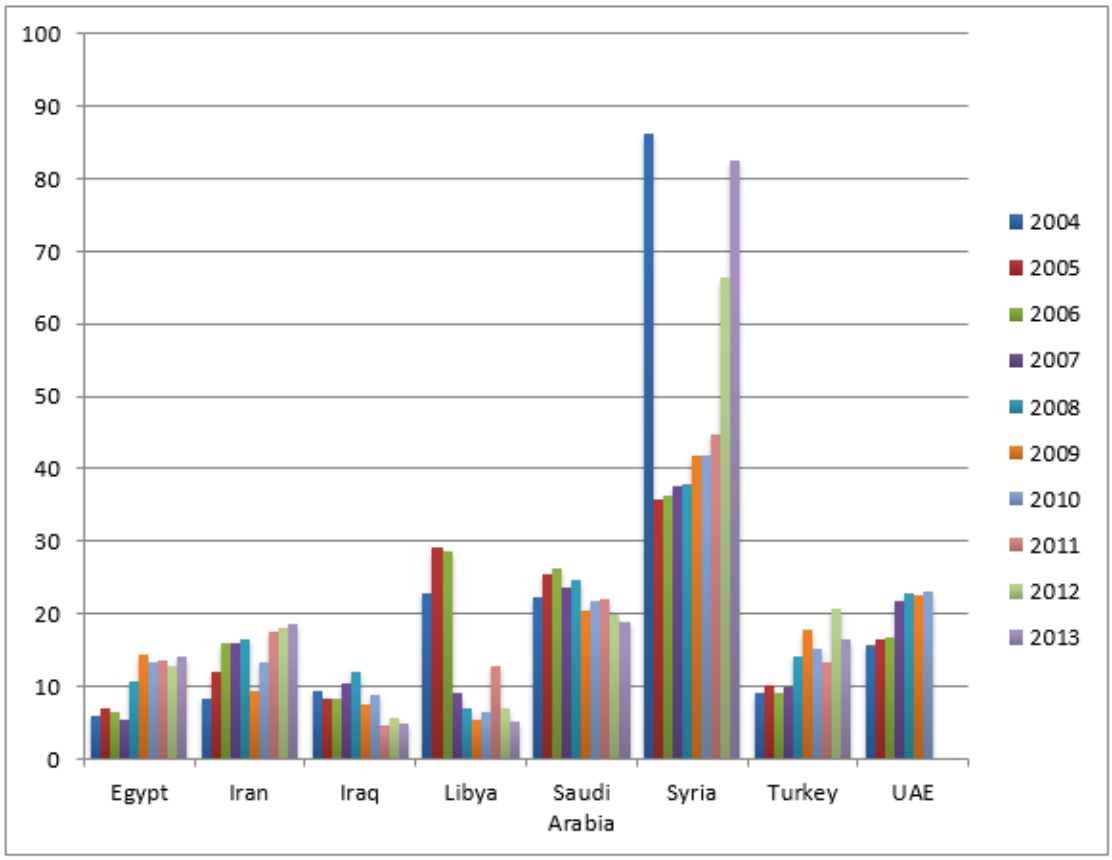

Figure 5. Regional Trade Integration, 2004 to 2013: Exports[1202]

[1201] International Monetary Fund, Direction of Trade Statistics.
[1202] Source: Data derived from International Monetary Fund, Direction of Trade Statistics.

Regional export relationships from 2004 to 2013 averaged above 10 percent for Iran, Libya, Saudi Arabia, Syria, Turkey, and the UAE.

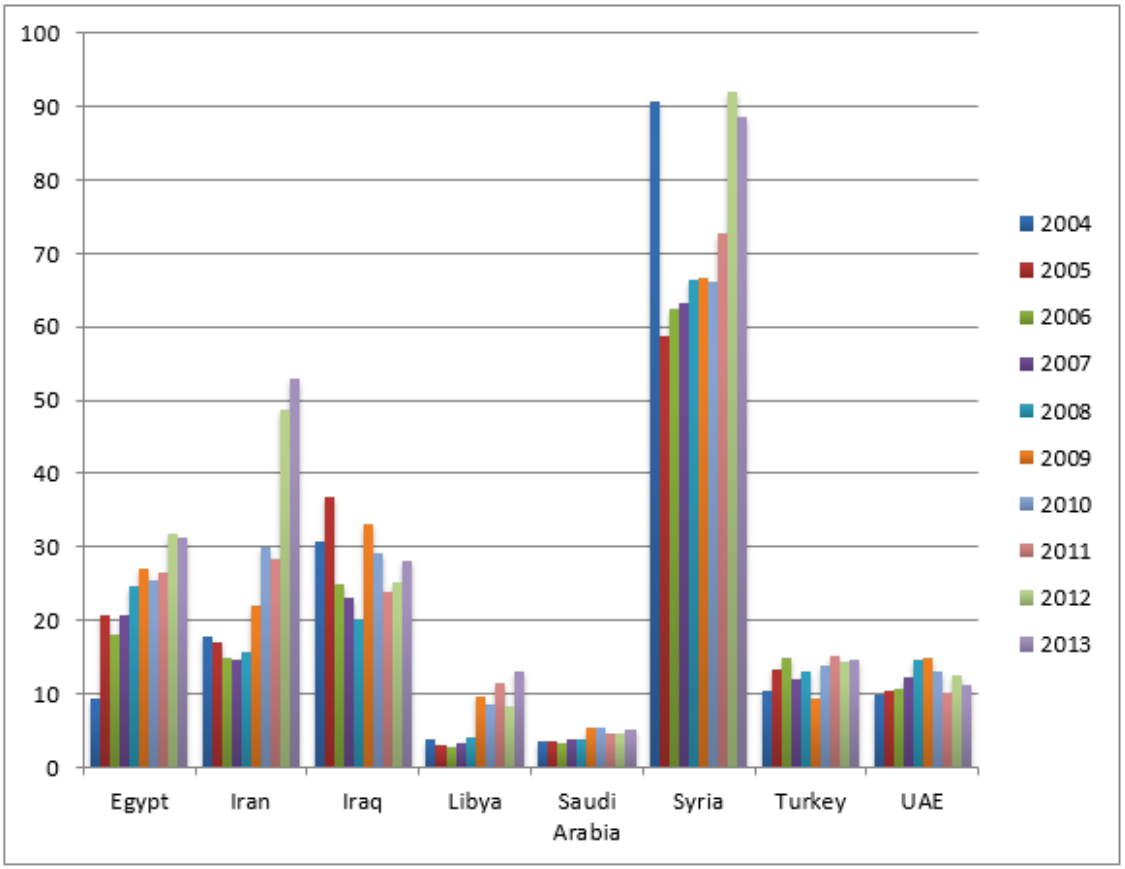

Figure 6. Regional Trade Integration, 2004 to 2013: Imports[1203]

Regional import relationships from 2004 to 2013 averaged above 10 percent for Egypt, Iran, Iraq, Syria, Turkey, and the United Arab Emirates.

During this time period, Syria's economic interdependence increased, which reflects the events of the country study in the first section of this chapter. Overall, during this time period, there was an increase in terms of regional exports and imports.

[1203] Source: Data derived from International Monetary Fund, Direction of Trade Statistics.

c. Regional Organizations and Alliances

In terms of regional interdependence for this time period, again, a survey of the regional organizations and alliances in the Middle East finds again that the states were not well integrated or deeply involved in regional alliances. Nevertheless, integration was improving in some sub-regions such as the Gulf. As noted previously, according to Paul, a state's level of involvement correlates with whether they are in a zone of high, moderate, or low conflict.[1204] In the latter, states are active members and become increasingly less so as the level of conflict increases.[1205]

For this section, the regional organizations and alliances that were included had to meet the criteria of having existed between 2004 and 2013 and primarily involved regional states. The regional alliances that were in place for all or part of this period included: 1) the Arab League and its accompanying Treaty of Joint Defense and Economic Cooperation between the States of the Arab League; 2) the Council of Arab Economic Unity, supported by the Arab League; 3) the Gulf Cooperation Council; 4) the Economic Cooperation Organization; and 5) the Iran-Syria defense pact and military cooperation agreement.

While the Arab League has a reputation for serving as a platform for rhetoric and grandstanding, during this time period, it played a greater role in regional affairs. First, it played an important role in bringing the 2006 war between Israel and Hezbollah to a close.[1206] Second, it helped negotiate the Doha Agreement in 2008 to bring peace to Lebanon.[1207] The League took several stands in regards to the 2011 Arab Uprising as well. First, it suspended Libya's membership in early 2011 for its treatment of protesters. The organization came together again in late 2011 to suspend Syria's membership for its treatment of protesters. But, Dakhlallah assessed that the League "has proven more effective at resolving relatively minor inter-regional disputes and internal crises than

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[1204] Paul, *Power versus Prudence*, 20–21.

[1205] Ibid.

[1206] Farah Dakhlallah, "The Arab League in Lebanon: 2005–2008," *Cambridge Review of International Affairs* 25, no. 1 (March 1, 2012): 53–74, https://doi.org/10.1080/09557571.2011.646241.

[1207] Ibid.

dealing with large-scale extra-systemic conflicts or civil wars."[1208] It was individual states in the region that took military action regarding these issues.

During this time, the Council of Arab Economic Unity oversaw the establishment of one new regional trade agreement and the expansion of another. In 2004, the Agadir Agreement setup a free-trade zone between Egypt, Morocco, Jordan, and Tunisia. Then, in 2009, Algeria joined the 17 countries that made up the Greater Arab Free-Trade Area.

The Gulf Cooperation Council became a stronger force within the Middle East region from 2004 to 2013, especially toward the end of the timeframe. In May 2011, the Gulf Cooperation Council invited the two other monarchies in the region, Morocco and Jordan, to apply for membership, "creating a Gulf Cooperation Council +2 front that, for all intents and purposes, shores up the Gulf alliance by adding more advanced military skills and capabilities to their own fledgling, if very well-equipped, military forces."[1209] Also, possible Gulf Cooperation Council membership for Yemen was intermittently discussed. Separately, the Gulf Cooperation Council played a key role in negotiating a political settlement and the departure of Yemen's president in November 2011 following the eruption of conflict there. Finally, in December 2012, the Gulf Cooperation Council members signed a collective security agreement.

During this time period, the accomplishments of the Economic Cooperation Organization, of which Iran and Turkey were members, were rather limited. Richard Pomfret writes that there was "little evidence of actual achievements or of significant commitment to the institution by Central Asian countries."[1210] Furthermore, while Iran led the founding of the Tehran-based Economic Cooperation Organization Trade Promotion Organization in 2009, Central Asia, its target audience as Iran sought to expand its reach eastward, responded with a "lukewarm" reception.[1211]

[1208] Dakhlallah, "The League of Arab States and Regional Security: Towards an Arab Security Community?" 412.

[1209] Khoury, "The Arab Cold War Revisited: The Regional Impact of the Arab Uprising."

[1210] Richard Pomfret, *Regionalism in East Asia: Why Has It Flourished Since 2000 and How Far Will It Go?* (Singapore: World Scientific Publishing Company, 2010), 24.

[1211] Ibid.

Finally, Iran and Syria signaled their growing ties by signing the Iran-Syria defense pact in June 2006 and a military cooperation agreement in March 2007. While the text of the agreement has not been publicized, the accords seemed to formalize an already close security relationship. Iran did indeed come to the aid of the Syrian government following the onset of civil conflict in 2011. But in regards to nuclear issues, it did not react when Israel destroyed Syria's reactor.

In sum, several regional organizations seemed to strengthen over the period—the Gulf Cooperation Council, the Arab League, and the Iran-Syria security agreements. Of note, this strengthening reinforced the region's political fault lines.

While the region can still be classified as a high-conflict zone based on Paul's characterization of this phenomenon, the militarized interstate disputes data, economic interdependence, and regional alliances improved slightly over this time period, perhaps signaling a stronger regional system. For example, in Latin America and the Caribbean, a region that has instituted a NWFZ, the average number of militarized interstate disputes per year was 3.29.[1212] From 2004 to 2013, three of the 33 countries that signed the Treaty of Tlatelolco experienced five or more militarized interstate disputes. They included Colombia with 9, Ecuador with 5, and Venezuela with 5.[1213]

C. CONCLUSION

By the end of 2013, regional nuclear proliferation had decreased again with the great powers driving that trend aided by the emergence of post-hegemonic cooperation by three European states. The evidence presented here indicated that the great powers would work to combat regional nuclear proliferation and deter its increase bolstered by a strengthened nonproliferation regime. This nuclear trend was a testament to the effectiveness of the tools, especially targeted economic sanctions, which the great powers

[1212] Palmer et al., "The MID4 Data Set: Procedures, Coding Rules, and Description."

[1213] Ibid.

could wield to limit proliferation. It was continuing "evidence of the great power commitment to nonproliferation."[1214]

In addition, post-hegemonic cooperation in the context of the nonproliferation regime proved to be an important factor in this outcome. Germany, France, and the United Kingdom began a negotiation process with Iran in the early 2000s that converted to a larger initiative with the United States, Russia, and China joining in. Iran's violations of its NPT commitments gave the three European states the authority on the international stage to undertake this independent effort.

[1214] James Wirtz and Peter Lavoy, "Introduction," in *Over the Horizon Proliferation Threats*, ed. James Wirtz and Peter Lavoy (Palo Alto, CA: Stanford Security Studies, 2012), 5.

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V. EXTERNAL MANAGEMENT AND THE NONPROLIFERATION REGIME

The introduction of this dissertation discussed nuclear proliferation trends in world regions. It questioned the cause of these trends. What caused a region to nuclearize, defined as nuclear weapons spread or horizontal proliferation, or denuclearize? To parallel the Middle East region, one would expect regional conflict and rivalry to drive nuclear proliferation under bipolarity. This would be due to the high level of superpower competition that blunted the effectiveness of external management efforts and, thus, regional rivals had greater freedom to proliferate. In the unipolar period, one would anticipate that the United States, as the sole superpower, would drive nuclear proliferation trends. As the external manager, it had more leeway to implement a nonproliferation agenda, to include strengthening the nonproliferation regime, and greater resources to dedicate to this task. In the multipolar period, one would expect great power competition or cooperation facilitated by a strengthened nonproliferation regime to drive regional trends. I found that similar trends could be identified in a number of other regions.

This research finding points to an interesting relationship between competition in the international system and regional nuclear proliferation trends. From 1973 to 2003, a time period that covers the bipolar and unipolar periods, increased competition in the international system often led to increased nuclear proliferation at the regional level. Decreased competition in the international system often led to decreased nuclear proliferation at the regional level. Figure 7 illustrates this relationship.

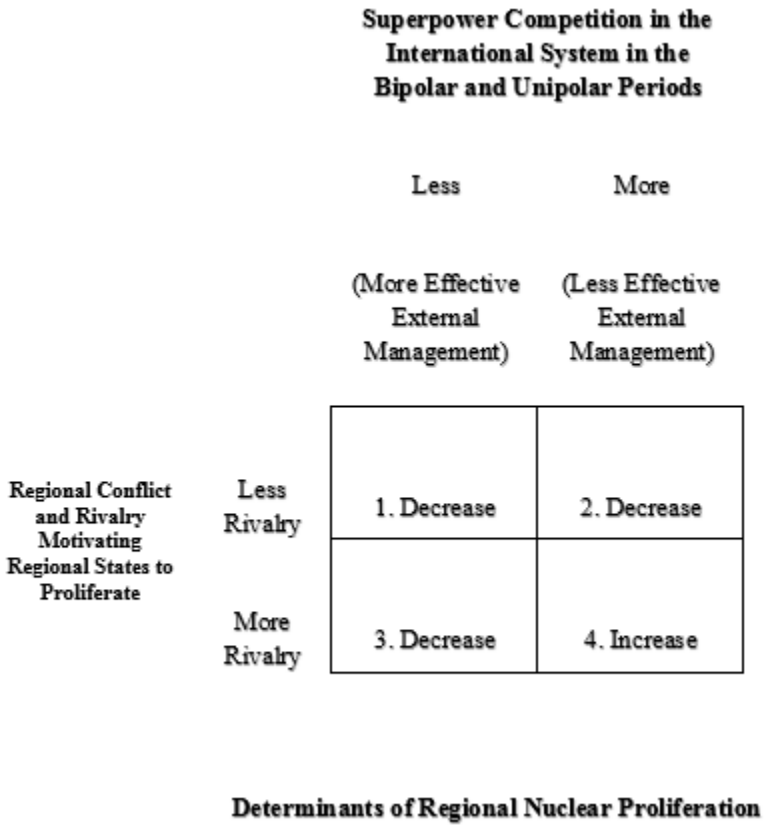

Figure 7. Determinants of Regional Nuclear Proliferation Trends in the Bipolar and Unipolar Periods

By the end of the third time period in 2013, representative of the multipolar period, horizontal nuclear proliferation seemed to be largely contained. While competition or cooperation between the great powers shaped regional proliferation outcomes in this final period, the nonproliferation regime continued to help limit proliferation despite the reduction of U.S. influence. In the Middle East, the role of the EU-3—Germany, the United Kingdom, and France—in the initiation of Iran negotiations in the early 2000s provides a case in point. The three periods taken together illustrate the critical role of external managers in limiting nuclear proliferation spread and how the nonproliferation regime, a key tool for external managers, served as an important bulwark against nuclear proliferation in these management efforts.

This analytical chapter covers the following linked topics. First, I review my research findings in regards to the Middle East. Second, I discuss the theoretical implications of this research. Third, I examine each of the world's other main regions to highlight how the theoretical framework might explain nuclear proliferation trends over time in these geographic areas. And, fourth, in my conclusion, I highlight the importance of these findings to the field of nuclear proliferation studies.

A. DRIVERS OF NUCLEAR PROLIFERATION TRENDS IN THE MIDDLE EAST

I approached the puzzle of divergent proliferation trends by selecting two theories from the scholarly literature on nuclear proliferation. The first theory used concepts from Kenneth Waltz's *Theory of International Politics* to analyze the extent to which the superpowers or great powers acted as international managers, limiting the nuclear ambitions of regional states. The second theory examined the role of regional security dynamics on nuclear proliferation described by T.V. Paul in *Power Versus Prudence*, which suggests that states respond to regional threats, not superpower preferences, when it comes to their proliferation policies. I asked if one theory could account for variations over time in the Middle East and if one theory could explain specific periods better than the other. An overview of my hypotheses contrasted with the empirical evidence is presented in Table 4. A downward pointing arrow (🡻) signifies a decrease in regional nuclear proliferation and an upward pointing arrow (🡹) signifies an increase in regional nuclear proliferation. "RR" stands for regional conflict and rivalry and "EM" stands for external management.

Table 4. Dissertation Hypotheses Contrasted with Empirical Evidence

	Bipolar Period	**Unipolar Period**	**Multipolar Period**
Hypotheses Based on Waltz (EM)	🡻	🡹	🡹
Hypotheses Based on Paul (RR)	🡹	🡻	🡹
Empirical Evidence	🡹	🡻	🡻

Two of the three hypotheses based on Paul's work correlate with the empirical evidence. Nevertheless, over the course of my research I found that the hypotheses based on Paul's work should have predicted an increase in nuclear proliferation in all three periods due to the unflagging nature of the intensity of conflict. I predicted in my hypothesis that conflict and rivalry in the Middle East would diminish in the unipolar period, but it did not. An overview of my hypotheses with this revision contrasted with the empirical evidence is presented in Table 5.

Table 5. Revised T.V. Paul Hypotheses Contrasted with Empirical Evidence

	Bipolar Period	**Unipolar Period**	**Multipolar Period**
Hypotheses Based on Waltz (EM)	🡻	🡹	🡹
Hypotheses Based on Paul (RR)	🡹	🡹	🡹
Empirical Evidence	🡹	🡻	🡻

Examining the revised hypotheses, a pattern emerged between the predictions drawn from Waltz's writings and the empirical evidence uncovered in the three preceding chapters. In fact, what occurred was the exact opposite of what was predicted. This

appeared to point to a possible systemic reason for the results. Examining the empirical evidence, I found that external managers drove nuclear proliferation trends, but these efforts could be blunted or limited by superpower competition in the international system. Regional conflict and rivalry seemed to play a determinative role in proliferation trends when external management efforts were suppressed or constrained. I found that the regional security environment explained why nuclear proliferation increased in the bipolar period and that external management explained why nuclear proliferation decreased in the Middle East in the unipolar and multipolar periods.

Given the high levels of conflict and rivalry in the Middle East region, it would seem that the regional security environment would drive proliferation trends throughout the three time periods. I found, however, that the regional security environment played a less important role in proliferation outcomes in the second and third time periods. While nuclear proliferation increased in the bipolar period, it decreased in the unipolar and multipolar periods. External managers, especially the United States, played critical roles in determining whether nuclear proliferation ambitions translated to a nuclearization or denuclearization trend. The Middle East nuclear trends are summarized in Table 6. A plus (+) signifies an increase, a minus (-) means a decrease, and a zero (0) equals no change, i.e., no increase or decrease. “RR” stands for regional conflict and rivalry and “EM” stands for external management.

Table 6. Middle East Nuclear Proliferation Trends

	1973-1990 (Bipolar Period)	1991-2003 (Unipolar Period)	2004-2013 (Multipolar Period)
Egypt	- (EM)	0	0
Iran	+ (RR)	+ (RR)	+ (RR)
Iraq	+ (RR)	- (EM)	- (EM)
Libya	+ (RR)	- (EM)	- (EM)
Saudi Arabia	+ (RR)	0	0
Syria	0	+ (RR)	- (EM)
Turkey	0	0	0
United Arab Emirates	0	0	0

1. First Time Period: 1973 to 1990

At the height of regional conflict and rivalry during the period from 1973 to 1990, the superpowers agreed on the point that nuclear weapons proliferation should not occur, but regional states had the space to pursue nuclear weapons under the noses of the superpowers. There were four reasons for this: rogue nuclear suppliers or lack of control over the nuclear supply chain; a lack of knowledge or awareness of proliferation activities; a lack of cooperation among external managers; and, regional foreign policy concerns that took priority over nuclear proliferation issues.

Despite the uptick in regional nuclear proliferation, there were successes in the realm of nonproliferation. Egypt turned away from a nuclear weapons program to a nuclear hedge in response to superpower pressure. China began to respond to U.S. concerns regarding its support for Iran's nuclear program by 1990. Libya signed the Nuclear Nonproliferation Treaty (NPT) and a Safeguards Agreement. Saudi Arabia joined the NPT. Nevertheless, Iran, Iraq, and Libya seemed to advance their respective nuclear weapons programs undeterred.

During this period, the United States began to work to strengthen the nuclear nonproliferation regime to fill perceived gaps in the NPT. The U.S. government initiated

the founding of the Nuclear Suppliers Group in 1975 after India's nuclear test.[1215] It also worked to establish the Missile Technology Control Regime in 1987.[1216]

2. Second Time Period: 1991 to 2003

By 1991, the fierce Iran-Iraq War had come to an end, but regional conflict and rivalry persisted. Iraq and Iran continued to be each other's worst enemies. Iraq reinforced the illusion that it maintained a nuclear weapons program after the First Gulf War and its aftermath. Iran used asymmetric warfare to execute its regional foreign policy agenda. The Levant remained riddled with conflict.

Nevertheless, nuclear proliferation began to decrease over this time period with an international system presided over by a sole superpower. The First Gulf War, led by the United States, and the following dismantlement work resulted in the end of Iraq's nuclear program. Iraq's overall nuclear capabilities decreased sharply over the time period. The United States became aware of Iran's pursuit of nuclear weapons and began to increase pressure on Iran's suppliers. These suppliers primarily consisted of China, Russia, and Pakistan's A.Q. Khan network. Libya also relied heavily on the A.Q. Khan network to build its program, but suffered under U.S. sanctions related to Libya's pursuit of nuclear weapons and acts of state-sponsored terrorism. Libya reportedly began reaching out to the United States in 1999 regarding ending its nuclear weapons program. Libya publicly stated it was ending the program in late 2003.

In a unipolar setting, the sole superpower set nuclear nonproliferation as a very high priority. In fact, it was the stated rationale for the Second Gulf War. The United States wielded its political, economic, and military power to restrict nuclear proliferation. These efforts created a less permissive environment for would-be proliferators than had existed in the bipolar era. The United States eliminated some of the operational space for nuclear weapons acquisition that had previously existed. Thus, superpower management

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[1215] William Burr, "Declassified Documents Show Henry Kissinger's Major Role in the 1974 Initiative that Created the Nuclear Suppliers Group," National Security Archive Electronic Briefing Book (The George Washington University, April 21, 2014), http://nsarchive.gwu.edu/nukevault/ebb467/.

[1216] Savita Pande, "Missile Technology Control Regime: Impact Assessment," *Strategic Analysis* 23, no. 6 (September 1, 1999): 924, https://doi.org/10.1080/09700169908455096.

seemed to play the key role in the regional trend toward decreased nuclear proliferation during this period.

The United States also strengthened the nonproliferation regime. The Nuclear Suppliers Group and the Missile Technology Control Regime, established in the bipolar period, increased in membership and effectiveness. The United States launched the Cooperative Threat Reduction initiative in the early 1990s, which resulted in a significant reduction of nuclear material and technology in Europe and Central Asia. In 1993, the administration of U.S. President Bill Clinton began work to craft a replacement for the Cold War-era Coordinating Committee For Multilateral Export Controls, otherwise known as COCOM, which resulted in the creation of the Wassenaar Arrangement.[1217] The United States supported the 1997 creation of the Additional Protocol for the NPT as a response to the International Atomic Energy Agency's (IAEA) challenges of monitoring compliance in Iraq and North Korea. The Proliferation Security Initiative, focused on interdiction, was launched by the United States in May 2003 following an incident involving North Korea.[1218] U.S. President George W. Bush pitched the idea of what would become United Nations (UN) Security Council Resolution 1540 in a September 2003 speech.[1219]

3. Third Time Period: 2004 to 2013

The Middle East region continued to be filled with conflict. The Second Gulf War created regional instability. Most regional states had opposed the war and were wary of the destabilizing effect that it might have. In particular, Saudi Arabia, Iran, and Turkey were concerned about how the conflict would shape security dynamics.

[1217] Richard F. Grimmett, "Military Technology and Conventional Weapons Export Controls: The Wassenaar Arrangement" (Washington, DC: Library of Congress, Congressional Research Service, 2006), 2, http://handle.dtic.mil/100.2/ADA456447.

[1218] "Proliferation Security Initiative (PSI)," Nuclear Threat Initiative, accessed July 30, 2017, http://www.nti.org/learn/treaties-and-regimes/proliferation-security-initiative-psi/.

[1219] Tanya Ogilvie-White, "UN Security Council Resolution 1540: Origins, Status, and Future Prospects," in *International Cooperation on WMD Nonproliferation*, ed. Jeffrey W. Knopf (Athens, GA: University of Georgia Press, 2016), 141.

While regional conflict persisted throughout the period, regional security dynamics had completely shifted by 2013. Iraq and Iran, no longer sworn enemies, had grown closer and Iran now wielded more influence over its neighbor. Saudi Arabia and the Gulf States expressed heightened concern regarding Iran's nuclear aspirations and regional activities. Saudi Arabia replaced Iraq in a conflict dyad with Iran. By 2013, Egypt, Iraq, and Syria had receded in regional geopolitics. Each was absorbed in resolving its own domestic crisis. Saudi Arabia, supported by the United Arab Emirates, and Iran, Turkey, and Israel dominated regional security dynamics.

Despite the regional upheaval, nuclear proliferation showed another downward trend. The United States and the United Kingdom worked with Libya to dismantle its nuclear program. Israel destroyed Syria's nuclear reactor in 2007, according to U.S. intelligence.[1220] The United Kingdom, France, and Germany launched nuclear negotiations with Iran without U.S. involvement. The United States joined the initiative in 2006 along with Russia and China. This group, the P5+1, increased the political and economic pressure against Iran until it agreed to come to the negotiating table in 2013.

In a nascent multipolar system, nuclear proliferation appeared to decrease. The United States and other great powers found ways to cooperate as external managers and the guidelines established as part of an expanded nonproliferation regime provided the lanes in the road as to what "acceptable" nuclear activity entailed. Iran presents a clear case of a country that would likely have acquired nuclear weapons already if external managers had not blocked its efforts. In past periods, China had provided dual-use nuclear technology to Iran, but U.S. political pressure had moved it away from conducting these business transactions. In past periods, the United States often had taken the lead in nuclear negotiations with regional states, sounding the alarm regarding nuclear activities that it deemed illicit, but three European countries assumed this role with Iran in the early to mid-2000s. This effort might be viewed as an example of major actors in the international system initiating effective nonproliferation measures.

[1220] Office of the Director of National Intelligence, "Background Briefing with Senior U.S. Officials on Syria's Covert Nuclear Reactor and North Korea's Involvement," 3.

I found that nuclear proliferation decreased during the unipolar and multipolar periods in the Middle East. This occurred despite the fact that the Middle East remained a high-conflict region. The primary vehicles used by the United States to combat nuclear proliferation were unilateral initiatives such as economic sanctions and the nonproliferation regime broadly defined. The transition from a bipolar period to a unipolar period strengthened the U.S. hand as an external manager to combat nuclear proliferation. The United States as the sole superpower was less constrained, allowing it to better reinforce the regime and punish outliers, closing perceived gaps in the nonproliferation regime. This strengthening had the effect of better establishing internationally recognized standards of behavior for nuclear-related activity. This finding points to the importance of the mechanisms to "manage" nuclear proliferation found in the nonproliferation regime—a regime that the United States played a key role in establishing. Whether this downward trend will continue in a multipolar setting, given multipolarity's fairly recent emergence, remains to be seen.

4. The Preponderant Role of the External Manager

The story that emerges throughout the three time periods is about the important role of the external manager(s) in shaping nuclear proliferation trends. Regional conflict and rivalry drove states to proliferate, but superpower or great power management constrained those efforts. Absent external management efforts, there likely would have been more nuclear weapons in the region. Unchecked, there was a strong likelihood that Iraq and Iran would have acquired nuclear weapons. Neither was it out of the question that Saudi Arabia and the United Arab Emirates might have been more motivated to acquire nuclear weapons from a willing supplier.

Conflict and rivalry did push regional states toward nuclear weapons proliferation, but the United States ultimately led the way in limiting proliferation joined by other great powers in a now-multipolar international system. Countries such as Russia and the United Kingdom did seek to limit nuclear proliferation during the first and second time periods, but the freedom of the United States to maneuver in the unipolar international system allowed the superpower to push forward its nonproliferation agenda

in a way that would not have been possible in a bipolar system, with high levels of superpower competition. Furthermore, the United States seemed to wield more influence over other great powers, such as Russia and China, in the unipolar period than under bipolarity.

The findings of this dissertation highlight the importance of external managers in shaping nuclear proliferation outcomes in the Middle East. But can any of these findings elucidate nuclear proliferation trends in other regions? The same dynamics that applied to superpower management of nuclear proliferation in the Middle East may pertain to the management of other world regions.

B. THEORETICAL IMPLICATIONS

In this dissertation, I tested two theories of nuclear proliferation through three empirically rich case studies to determine which theory best explained regional nuclear trends over time. Neo-realists predicted an increase in nuclear proliferation after the Cold War.[1221] Kenneth Waltz noted that proliferation would likely increase as the international system transitioned from bipolarity to multipolarity.[1222] Benjamin Frankel claimed "bipolarity inhibits the spread of nuclear weapons while multipolarity induces their proliferation."[1223] He also asserted that the nonproliferation regime might be a casualty of bipolarity's end.[1224] These predictions did not come to pass. My research on the Middle East found that the opposite occurred.

While Waltz did not explicitly state what effect unipolarity would have on nuclear proliferation, I found that unipolarity led to a decrease in nuclear proliferation in the Middle East. Thus, a key finding is that in the unipolar period, a time period of greater

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[1221] Frankel, "The Brooding Shadow: Systemic Incentives and Nuclear Weapons Proliferation"; Mearsheimer, "Back to the Future: Instability in Europe after the Cold War"; Stephen Van Evera, "Primed for Peace: Europe after the Cold War," *International Security* 15, no. 3 (1990): 7–57, https://doi.org/10.2307/2538906.

[1222] Kenneth N. Waltz and Scott D. Sagan, *The Spread of Nuclear Weapons: A Debate*, First Edition (New York: W. W. Norton and Company, 1995).

[1223] Frankel, "The Brooding Shadow: Systemic Incentives and Nuclear Weapons Proliferation," 37.

[1224] Ibid., 64.

instability in the international system, nuclear proliferation decreased. And during a time period of greater stability in the international system, the bipolar period, nuclear proliferation increased. Finally, during the multipolar period, another period of instability in the international system, other great powers collaborated with the United States to constrain regional nuclear proliferation in the Middle East.

After the end of the Cold War, structural realists observed that proliferation decreased during the bipolar period and stated it would increase afterward. Superpower guarantees would erode and lead to greater insecurity for client states, thus motivating nuclear proliferation.[1225] In the Middle East, one of the world's high-conflict regions, nuclear proliferation increased during the bipolar period and decreased in a unipolar and multipolar setting. External management outside a bipolar setting seemed to be more effective in controlling nuclear proliferation. What explains this discrepancy?

I found that increased superpower competition in the international system blunted the effectiveness of external management efforts against nuclear proliferation. Systemic factors seemed to drive nuclear proliferation trends. They just did not work in the way that Waltz, Frankel, and others predicted that they would. The regional nuclear proliferation trend was more likely to be toward increased proliferation if there was greater competition at the systemic level. The regional nuclear proliferation trend was more likely to be toward a decrease if there was less competition at the systemic level, i.e., the unipolar period, allowing the global hegemon to manage nuclear concerns without having to weigh other foreign policy considerations to the extent that would be required in a bipolar system or to dedicate unreasonably large political and economic resources to achieving its nonproliferation goals.

Finally, structural realism predicted an increase in nuclear proliferation during the multipolar period. But, this did not occur in the Middle East. Rather, external managers came together to limit nuclear proliferation aided by a nonproliferation regime that had been strengthened by the global hegemon during the unipolar period. I find that a liberal institutionalist argument regarding regimes applies in the case of the nonproliferation

[1225] Ibid., 37.

regime. Robert Keohane argues that a global hegemon can create a regime in order to serve its interests and this regime's utility can outlast the time period in which the founding state remains the hegemon.[1226] In this case, the nonproliferation regime was created by the United States to serve a security need. As Zachary Davis notes, the nonproliferation regime serves the self-interest of many other states as well.[1227] The nonproliferation regime was a key tool used to manage nuclear proliferation. It has been strengthened over time, particularly by the efforts of the United States. Nevertheless, the nuclear nonproliferation regime could be weakened in the future. A weakened regime would mean that the increased great power competition might provide space once again for regional states to pursue nuclear weapons programs, and nuclear proliferation might increase again in some world regions due to regional conflict and rivalry.

Another important finding from my research is that different theories can best explain nuclear proliferation trends in different time periods. Regional conflict and rivalry drove nuclear proliferation trends in the bipolar period, external management drove trends in the unipolar period, and the nonproliferation regime played an increasingly important role in the multipolar period.

C. SYSTEMIC EFFECTS ON NUCLEAR TRENDS AT THE REGIONAL LEVEL

Returning to the role of systemic factors at the regional level, what systemic factors bear on nuclear proliferation in other world regions? Does the same pattern found in the Middle East exhibit itself in other world regions? Did bipolarity constrain superpower management efforts and was a unipolar environment more conducive to effective superpower management by the global hegemon, the United States? Under multipolarity, does increased competition in the international system limit external management efforts as it did in the bipolar period? Does the nonproliferation regime, which was strengthened by the United States in the unipolar period, play a role in managing nuclear proliferation in the multipolar period? Does the regime facilitate

[1226] Keohane, *After Hegemony*, 100.

[1227] Davis, "The Realist Nuclear Regime," 88.

cooperation? Are other great powers, such as Russia and China, cooperating with the United States to hold other states to the standards of behavior of the nonproliferation regime, even if only out of self-interest?

In this section, I briefly examine regional nuclear proliferation trends around the globe in a bipolar setting, a unipolar setting, and a multipolar setting and attempt to determine the relevance of my findings from the Middle East for these other regions. This analysis is not meant to be comprehensive, but instead illustrative, aiming primarily to test the strengths and weaknesses of the conceptual findings from the Middle East against proliferation trends elsewhere in the world. The timeframes examined are the same as for the studies on the Middle East: 1973 to 1990, 1991 to 2003, and 2004 to 2013. Like the previous research chapters, the focus is on horizontal nuclear proliferation or proliferation spread rather than vertical proliferation. The world regions are divided as follows: Africa, Central Asia, Europe, Latin America, Northeast Asia, South Asia, South Pacific, and Southeast Asia. Regional states are included if they had at one time pursued nuclear weapons, acquired a nuclear weapons capability, or might have pursued nuclear weapons. A brief analysis of the findings is included at the end of each section. The chapter ends with concluding remarks. An overview of my findings on horizontal nuclear proliferation trends at the regional level is presented in Table 7. A plus (+) signifies an increase in horizontal proliferation, a minus (-) means a decrease, and a zero (0) equals no change, i.e., no increase or decrease. As above, "RR" stands for regional conflict and rivalry and "EM" stands for external management. I have added another variable here to describe those regions that came together to form nuclear-weapon-free zones (NWFZ) in a bottom-up fashion in reaction to the history of superpower nuclear weapons activities in their regions. For this variable, "I" stands for identity.

Table 7. Nuclear Proliferation Trends at the Regional Level

	Bipolar Period (1973-1990)	Unipolar Period (1991-2003)	Multipolar Period (2004-2013)
Middle East	+ (RR)	- (EM)	- (EM)
Africa	+ (RR)	- (EM)	- (I)
Central Asia	0*	- (I)	- (I)
Europe	0*	- (I)	- (I)
Latin America	- (RR)	- (EM)	0
Northeast Asia	- (EM)	+ (RR)	+ (RR)
South Asia	+ (RR)	+ (RR)	0
South Pacific	- (EM)	- (I)	0
Southeast Asia	- (I)	- (I)	0

*The relevant states were a part of the Soviet Union.

1. The Bipolar Period: 1973 to 1990

In the bipolar period, regional conflict and rivalry levels drove nuclear proliferation trends in a majority of world regions. Regional conflict and rivalry drove an increase in proliferation in the Middle East, Africa, and South Asia. In Africa and South Asia, like the Middle East, rogue nuclear suppliers, a lack of knowledge regarding proliferation activities, a lack of cooperation by external managers, and regional foreign policy concerns that trumped nuclear proliferation worries shaped this outcome.

Lowered regional tensions drove a decrease in nuclear proliferation in Latin America. A regional history of competition between the nuclear-armed superpowers in Vietnam accompanied by peaceful and cooperative relations in Southeast Asia seemed to pave the way for the members of the Association of Southeast Asian Nations to propose a NWFZ in the mid-1980s. External management efforts by the United States led to a downward nuclear proliferation trend in Northeast Asia and the South Pacific.

a. Africa

In Africa, nuclear proliferation increased during the bipolar period due to the regional security environment. From 1973 to 1990, two states in Africa, Algeria and Libya, advanced their nuclear capabilities and one state, South Africa, developed nuclear

weapons. For the purposes of this dissertation, Egypt and Libya were covered in the case studies on the Middle East and here I discuss the programs of Algeria and South Africa.

Algeria's nuclear history began in the 1960s. Starting when Algeria was still a French colony, the French carried out seventeen nuclear weapons tests in Algeria from 1960 to 1966.[1228] After gaining independence in 1962, Algeria became a member of the IAEA in 1963. It began to develop its own nuclear program in the early 1980s. The country had sought to obtain nuclear research reactors from the United States and Western European suppliers without success. In the case of the United States, the superpower had insisted that in order for the United States to provide the reactors, Algeria would have to sign the NPT and accept IAEA Safeguards.[1229] Algeria refused. The country appeared to want to keep its options open for a nuclear weapons program.

The country then turned to more willing suppliers. In 1985, Argentina's INVAP agreed to provide Algeria with its first research reactor, reactor fuel (uranium enriched up to 20 percent), and a pilot fuel-fabrication plant.[1230] Construction on the 1MW(e) pool-type Nur reactor began in 1987 and it went critical in 1989.[1231] The country signed a nuclear cooperation agreement with China in 1983 for the Es Salam research reactor. China agreed to provide a heavy water research reactor, heavy water, and fuel.[1232] Construction began on the reactor in 1988. In terms of delivery systems, Algeria did not acquire any ballistic missiles.

The regional security environment served as the motivation for Algeria's nuclear efforts. Algeria's neighbor Libya was pursuing nuclear weapons and Egypt did not completely devote itself to a civilian nuclear program until the early 1980s. Morocco and

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1228 "Profile for Algeria."

1229 Central Intelligence Agency, Directorate of Intelligence, "Middle East-South Asia: Nuclear Handbook," 3.

1230 International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran*, 107; "Profile for Algeria."

1231 International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Ira.*, 107.

1232 U.S. Department of State, "Memo from Steve Aoki to Herb Levin, Ellie Busick, and Richard Albright, Enclosing Chinese Paper on Nuclear Cooperation with Algeria" (Washington, DC: U.S. Department of State, April 29, 1991), http://nsarchive.gwu.edu/nukevault/ebb228/Algeria-14.pdf.

Algeria had rocky relations throughout most of the period. Nuclear hedging would demonstrate Algeria's capacity to compete with its neighbors.

South Africa was the only country known to have developed nuclear weapons in Africa. Also, it was the only country in the world known to have built nuclear weapons and then relinquished them.[1233] South Africa established its Atomic Energy Board in 1948 and proceeded to develop a nuclear program relying primarily on suppliers from Western Europe.[1234] The country's leadership claimed the program was for peaceful purposes.

South Africa's nuclear weapons program began around 1973 when scientists started to work on the design for a weapon.[1235] South African President F.W. De Klerk claimed that the decision to acquire a nuclear deterrent was made as the Soviet Union expanded into southern Africa in this timeframe.[1236] South Africa prepared a nuclear test site in the Kalahari, which was discovered by the Soviet Union in 1977, according to Cirincione, Wolfsthal, and Rajkumar.[1237] Murrey Marder and Don Oberdorfer reported that the Soviet Union and the United States assisted by France, the United Kingdom, and West Germany confronted South Africa regarding the site and received a promise it would not build a nuclear explosive device and no nuclear testing would occur in South

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[1233] Jean du Preez and Thomas Maettig, "From Pariah to Nuclear Poster Boy: How Plausible Is a Reversal?" in *Forecasting Nuclear Proliferation in the 21st Century: Volume 2, A Comparative Perspective*, ed. William Potter and Gaukhar Mukhatzhanova (Palo Alto, CA: Stanford Security Studies, 2010), 302.

[1234] Director of Central Intelligence, "Trends in South Africa's Nuclear Security Policies and Programs," National Intelligence Estimate (Central Intelligence Agency, October 5, 1984), 12, http://nsarchive.gwu.edu/NSAEBB/NSAEBB181/sa27.pdf.

[1235] "Profile for South Africa—Nuclear," Nuclear Threat Initiative, accessed March 13, 2017, http://www.nti.org/learn/countries/south-africa/nuclear/.

[1236] F.W. De Klerk, March 24, 1993, in "Speech by South African President F.W. De Klerk to a Joint Session of Parliament on Accession to the Non-Proliferation Treaty" (History and Public Policy Program Digital Archive, Archives.un.org), http://digitalarchive.wilsoncenter.org/document/116789.pdf?v=c254c7fd2c4f6c4da62736d89b725760.

[1237] Cirincione, Wolfsthal, and Rajkumar, *Deadly Arsenals*, 409–10.

Africa.[1238] South Africa was aware of what the implications would be, allowing an economic embargo against South Africa to go forward, if it did not comply.[1239] According to U.S. intelligence, South Africa's Prime Minister John Vorster temporarily halted the program.[1240]

After the 1977 event, South Africa took a more opaque approach to its nuclear activities. The Central Intelligence Agency referred to it as "calculated ambiguity" and defined it as "intimating that it has the capability to produce nuclear weapons while disavowing any interest in doing so."[1241] The government acknowledged in its deterrence strategy in 1993 that "if the situation in southern Africa were to deteriorate seriously, a confidential indication of the deterrent capability would be given to one or more of the major powers, for example the United States, in an attempt to persuade them to intervene."[1242]

South Africa continued to advance its program. In 1979, the U.S. Vela satellite captured a double flash in the South Atlantic—a possible test of a nuclear device, according to the Nuclear Threat Initiative.[1243] Allegations regarding a nuclear weapons test were denied.[1244] By 1983, the Central Intelligence Agency had assessed that South Africa either possessed nuclear weapons or had the means to assembly them quickly.[1245] South Africa eventually acknowledged that seven nuclear devices were planned and six

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[1238] Murrey Marder and Don Oberdorfer, "How West, Soviets Acted to Defuse S. African A-Test," *Washington Post*, August 28, 1977, https://www.washingtonpost.com/archive/politics/1977/08/28/how-west-soviets-acted-to-defuse-s-african-a-test/eada5bcc-7727-4c32-b8e2-f21d55a9d4c3/?utm_term=.6a905ff2ad46.

[1239] Ibid.

[1240] Central Intelligence Agency, Directorate of Intelligence, "New Information on South Africa's Nuclear Program and South African-Israeli Nuclear and Military Cooperation," March 30, 1983, http://nsarchive.gwu.edu/NSAEBB/NSAEBB181/sa26.pdf.

[1241] Director of Central Intelligence, "Trends in South Africa's Nuclear Security Policies and Programs," 15.

[1242] De Klerk, "Speech by South African President F.W. De Klerk to a Joint Session of Parliament on Accession to the Non-Proliferation Treaty," 4.

[1243] "Profile for South Africa—Nuclear."

[1244] Ibid.

[1245] Central Intelligence Agency, Directorate of Intelligence, "New Information on South Africa's Nuclear Program and South African-Israeli Nuclear and Military Cooperation."

devices were completed.[1246] With the end of the Cold War approaching and Soviet regional influence waning, South Africa's president F.W. De Klerk led an effort to end the country's nuclear weapons program in 1989.[1247] South Africa began to dismantle its nuclear program.

In terms of delivery systems, South Africa began a ballistic missile program in the mid-1970s, according to the Nuclear Threat Initiative.[1248] Cirincione, Wolfsthal, and Rajkumar wrote that the country worked to build a medium-range ballistic missile in the 1980s, disguising its efforts as a space program.[1249] They noted that the United States began to scrutinize South Africa's ballistic missile program in the late 1980s, but South Africa continued to develop its missile program.[1250]

South Africa's nuclear behavior during this time period was shaped by systemic and regional factors. South Africa confronted a security threat from neighboring states. Behind that threat, however, loomed the Soviet Union. South Africa faced off against encroaching Soviet influence in southern Africa in the mid-1970s, particularly in the form of Soviet-backed Cuban troops from 1975 to 1989 in Angola's civil war.[1251] South Africa stood alone as it opposed these Soviet-supported elements. The United States and the international community opposed South Africa's apartheid policy and sought to maintain pressure on South Africa to end the policy, withholding any support.

Building nuclear weapons was a self-help mechanism for an isolated state. While South Africa seemed to believe that possibly the United States would come to its aid in a crisis, based on De Klerk's 1993 revelation regarding South Africa's nuclear strategy, South Africa did not possess any assurances of superpower security guarantees. The shift

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[1246] De Klerk, "Speech by South African President F.W. De Klerk to a Joint Session of Parliament on Accession to the Non-Proliferation Treaty," 3–4.

[1247] Paul, *Power versus Prudence*, 116.

[1248] "Profile for South Africa—Missile," Nuclear Threat Initiative, accessed March 31, 2017, http://www.nti.org/learn/countries/south-africa/delivery-systems/.

[1249] Cirincione, Wolfsthal, and Rajkumar, *Deadly Arsenals*, 413.

[1250] Ibid., 413.

[1251] du Preez and Maettig, "From Pariah to Nuclear Poster Boy: How Plausible Is a Reversal?," 307.

in the international system led to a reduction of the regional threat and prompted South Africa to reconsider its nuclear weapons program. Nevertheless, South Africa's ballistic missile program remained intact.

The regional security environment drove the nuclear choices of Algeria and South Africa during the bipolar period. The same issues that plagued the Middle East also affected nuclear proliferation trends in Africa. These included a lack of control over the nuclear supply chain, a lack of awareness regarding proliferation activities, a lack of cooperation or coordination on nuclear issues, and regional foreign policy issues that trumped nuclear proliferation concerns.

b. Central Asia

The Central Asian country considered in this analysis is Kazakhstan – the only regional state that both had and gave up strategic nuclear weapons after the Cold War.[1252] During the bipolar period, Kazakhstan was still a part of the Soviet Union. Nevertheless, it is worth considering what the state experienced during this period as it provides the context for future nuclear policy decisions.

Central Asia was home to extensive nuclear testing, nuclear warheads, and nuclear-capable missiles. The Soviet Union conducted 456 nuclear tests in Kazakhstan at the Semipalatinsk test site between 1949 and 1989.[1253] Kazakhstan also hosted a large arsenal of the Soviet Union's nuclear-armed intercontinental ballistic missiles.[1254]

By the late 1980s, concerns began to arise regarding health effects from the radioactive fallout from Soviet nuclear tests. In 1989, a team of Soviet and Kazakh officials began to study health problems in the Semipalatinsk, but understated the impact of the radioactive fallout.[1255] After the fall of the Soviet Union, the country would have

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[1252] "Profile for Kazakhstan—Nuclear," Nuclear Threat Initiative, accessed March 19, 2017, http://www.nti.org/learn/countries/kazakhstan/nuclear/.

[1253] Togzhan Kassenova, "The Lasting Toll of Semipalatinsk's Nuclear Testing," *Bulletin of the Atomic Scientists*, September 28, 2009, http://thebulletin.org/lasting-toll-semipalatinsks-nuclear-testing.

[1254] "Profile for Kazakhstan—Nuclear."

[1255] Kassenova, "The Lasting Toll of Semipalatinsk's Nuclear Testing."

security concerns that might provide a rationale for maintaining its nuclear capabilities. The after-effects of the nuclear testing shaped national thinking regarding the utility of nuclear weapons.

c. Europe

Belarus and the Ukraine, a part of the Soviet Union during the bipolar period, are included here as they were the only states in Europe to inherit nuclear weapons capabilities after the Cold War. This background provides a context for the denuclearization that occurred in the unipolar period.

The Ukraine hosted a significant Soviet-era nuclear arsenal and production facilities, especially for delivery systems. It included nearly 2,000 nuclear warheads, at least 2,500 tactical nuclear weapons, over 175 intercontinental ballistic missiles, and 44 strategic bombers with 55 air-launched cruise missiles.[1256] After the end of the Soviet Union, only the nuclear stockpiles of the United States and Russia surpassed Ukraine's stockpile, according to the Nuclear Threat Initiative.[1257]

Under the Soviet Union, the Ukraine also developed its nuclear power infrastructure. Construction on the Chernobyl power plant, Ukraine's first, began in 1970 and it started operating in 1977.[1258] Disaster struck in April 1986 when the core of one of the reactors exploded releasing radioactive material into the air. By the end of 1989, Ukraine had 12 nuclear power reactors in operation.[1259] The Chernobyl accident led to a halt in nuclear power development beginning in 1990 and continuing until the mid-1990s.[1260]

1256 "Profile for Ukraine—Nuclear"; Steven Pifer, "The Trilateral Process: The United States, Ukraine, Russia and Nuclear Weapons," Arms Control Series (Washington, DC: Brookings Institution, May 2011), 4, https://www.brookings.edu/wp-content/uploads/2016/06/05_trilateral_process_pifer.pdf.

1257 "Profile for Ukraine—Nuclear."

1258 "Nuclear Power in Ukraine," World Nuclear Association, March 13, 2017, http://www.world-nuclear.org/information-library/country-profiles/countries-t-z/ukraine.aspx.

1259 Ibid.

1260 "Profile for Ukraine—Nuclear."

Belarus hosted a smaller nuclear arsenal when it was a part of the Soviet Union. It included nuclear-armed ballistic missiles and tactical nuclear weapons.[1261] At the end of the Cold War, Belarus possessed 81 single-warhead intercontinental ballistic missiles and 725 tactical nuclear weapons.[1262] Belarus also inherited a significant stock of highly enriched uranium from the Soviet Union for use with a nuclear research reactor.[1263] The Sosny Science and Technology Center held this material.[1264]

Both the Ukraine and Belarus inherited significant nuclear capabilities from the Soviet Union. As the Cold War ended and those states gained their independence, it was an open question as to how their nuclear arsenals might be handled.

d. Latin America

In Latin America, nuclear proliferation increased before yielding to nonproliferation accords as regional rivalry decreased. Argentina's nuclear program began in the 1950s. The country started to aggressively advance its nuclear program in the 1960s. In addition, Argentina opted to sign, but not ratify the 1967 NWFZ treaty for Latin America, the Treaty of Tlatelolco. Paul notes that its efforts resulted in the construction of three nuclear power plants along with several unsafeguarded facilities – one for uranium enrichment, which could produce up to 20 percent-enriched uranium; another for reprocessing; another for fuel fabrication; and another for heavy-water processing.[1265] Argentina seemed to be motivated to establish itself as a regional power, especially in its military competition with Brazil.[1266] It was also possibly spurred by its loss to the United Kingdom in the 1982 Falklands War.

1261 "Profile for Belarus."

1262 Pifer, "The Trilateral Process," 5; Cirincione, Wolfsthal, and Rajkumar, *Deadly Arsenals*, 367.

1263 William C. Potter, "Belarus Agrees to Remove All HEU" (James Martin Center for Nonproliferation Studies, December 1, 2010), http://www.nonproliferation.org/belarus-agrees-to-remove-all-heu-2/.

1264 Ibid.

1265 Paul, *Power versus Prudence*, 104–5; "Profile for Argentina."

1266 Paul, *Power versus Prudence*, 100–101.

The United States closely monitored Argentina's nuclear program as it advanced. A 1982 U.S. intelligence report highlighted U.S. objectives and concerns. The report noted that U.S. pressure on Argentina regarding its nuclear program during the 1970s caused deterioration in relations between the two countries.[1267] It discussed the challenge of attaining the U.S. objective of "full regional adherence to the Treaty of Tlatelolco – while ruling out the peaceful nuclear explosives development to which Argentina and Brazil claim a right."[1268] It expressed the worry that Argentina and Brazil would become nuclear suppliers with export guidelines below the standards of the London Suppliers Group – the predecessor to the Nuclear Suppliers Group – possibly multiplying proliferation concerns.[1269] Nevertheless, by the mid-1980s, there was speculation that, if Argentina chose to, it was only several years away from building a nuclear weapon. U.S. intelligence assessed that Argentina could possibly acquire a nuclear weapon by 1987 and have a delivery system ready in the 1990s.[1270] Despite U.S. awareness of Argentina's program and superpower efforts to dissuade proliferation, progress continued.

Nevertheless, the United States was cautious not to pressure Argentina too hard. The United States was aware that Argentina was the largest trading partner of the Soviet Union in Latin America.[1271] The Soviet Union had sided with Argentina in the Falklands War, but the United States wished to build better ties with the Southern Cone.[1272]

Relations began to improve between Brazil and Argentina in the mid-1980s. Argentina realized that the nature of its nuclear program obstructed its economic interests with its neighbor Brazil and internationally.[1273] The nuclear dynamic began to shift. The

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[1267] Director of Central Intelligence, "Nuclear Proliferation Trends through 1987," National Intelligence Estimate, July 27, 1982, 22–23, http://nsarchive.gwu.edu/nukevault/ebb423/docs/4.%20%20nuke%20prolif%20trends%20thru%2087.pdf.

[1268] Ibid., 23.

[1269] Ibid., 23.

[1270] Ibid., 22.

[1271] Rachel Schmidt, "U.S. and Soviet Relations with Argentina: Obstacles and Opportunities for the U.S. Army" (Santa Monica, CA.: RAND Corporation, 1989), v–vii, https://www.rand.org/content/dam/rand/pubs/notes/2009/N2916.pdf.

[1272] Ibid., vi.

[1273] Paul, *Power versus Prudence*, 106.

two countries made overtures to one another regarding the peaceful nature of their nuclear programs. They made a declaration regarding the peaceful purposes of their nuclear programs in 1985 and began site visits to one another's nuclear facilities in 1987. By the late 1980s, Argentina appeared to have definitively distanced itself from its previous nuclear proliferation efforts.

Argentina also developed several missile programs. In the 1970s, Argentina's Condor I missile program aimed to produce short-range ballistic missiles with a range of 150 km, according to the Nuclear Threat Initiative.[1274] This report further notes that, after the Falklands War, Argentina moved ahead with the Condor II program, seeking to produce a missile with a range of 1,000 km and suppliers from European states provided the various parts for both programs.[1275]

As the 1980s drew to a close, Argentina faced increasing pressure from the United States regarding its missile program. The United States especially had grown concerned about the Condor II program's connections to the Middle East. U.S. President Ronald Reagan issued a directive to restrict the transfer of nuclear capable missiles in 1982 and used it to target Argentina's suppliers in Western Europe.[1276] Argentina's program also became the focus of the Missile Technology Control Regime, formed in 1987.[1277] Eduardo Barcelona and Julio Villalonga noted that the United States, as a regime member, pressured Argentina to end its program.[1278] The Central Intelligence Agency reported in November 1991 that, after 1988, the United States and its partners in the Missile Technology Control Regime worked to stymie any further acquisition of missile

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[1274] "Profile for Argentina—Missile," Nuclear Threat Initiative, accessed March 15, 2017, http://www.nti.org/learn/countries/argentina/delivery-systems/.

[1275] Ibid.

[1276] The White House, "National Security Decision Directive Number 70: Nuclear Capable Missile Technology Transfer Policy" (Reagan Library, November 30, 1982), https://reaganlibrary.archives.gov/archives/reference/Scanned%20NSDDS/NSDD70.pdf; "Profile for Argentina—Missile."

[1277] Cirincione, Wolfsthal, and Rajkumar, *Deadly Arsenals*, 388.

[1278] Eduardo Barcelona and Julio Villalonga, *Relaciones Carnales: La Verdadera Historia de la Construcción y Destrucción del Misil Cóndor II* (Carnal Relations: The True Story of the Construction and Destruction of the Condor Missile II) (Buenos Aires: Planeta, 1992).

technology by Argentina.[1279] The Agency assessed that Argentina's leadership sought to dismantle the program in order to improve bilateral relations with the United States.[1280] Argentina eventually canceled the program in August 1990.[1281] Improved regional relations provide the best answer as to why Argentina terminated its nuclear weapons program, but superpower management provides the best explanation as to why Argentina halted the Condor II program.

Brazil began its nuclear pursuits at the time of the Atoms for Peace program in the mid-1950s. Brazil was driven by its desire for regional hegemony and rivalry with Argentina.[1282] Like Argentina, the country focused heavily on developing its nuclear program from the 1960s until around 1990. Brazil signed the regional NWFZ treaty in 1967 and ratified it in 1968, but believed it still retained the right to conduct peaceful nuclear explosions, according to U.S. intelligence.[1283] In 1975, Brazil signed a contentious nuclear agreement with West Germany that would give Brazil the technology for a complete nuclear fuel cycle, according to Paul.[1284] The agreement, which was not completely fulfilled, entailed Brazil's acquisition of a reprocessing plant, a uranium enrichment plant, two nuclear power reactors, and an experimental laboratory for reprocessing irradiated nuclear fuel.[1285] Mitchell Reiss noted that Brazil also began a secret parallel military nuclear program in the mid-1970s, which came to light about ten years later.[1286] On the military side, Brazil sought to achieve the ability to enrich uranium. The military was interested in developing a nuclear-powered submarine, but the

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[1279] Central Intelligence Agency, "Status of the Condor II Missile Program," November 1, 1991, 2, https://www.cia.gov/library/readingroom/docs/DOC_0001175541.pdf.

[1280] Ibid., 1.

[1281] Ibid., 2.

[1282] Paul, *Power versus Prudence*, 100–101.

[1283] Director of Central Intelligence, "Brazil's Changing Nuclear Goals: Motives and Constraints," Special National Intelligence Estimate, December 1985, 2, http://nsarchive.gwu.edu/nukevault/ebb423/docs/6B.%20brazil%201985.pdf.

[1284] Paul, *Power versus Prudence*, 108.

[1285] Director of Central Intelligence, "Nuclear Proliferation Trends Through 1987," 22.

[1286] Mitchell Reiss, *Bridled Ambition: Why Countries Constrain Their Nuclear Capabilities* (Washington, DC: Woodrow Wilson Center Press, 1995), 50–51.

same technology could also be used to acquire fissile material for a possible bomb, according to Reiss.[1287]

Brazil's efforts achieved results. The country built a first nuclear power reactor, Angra I, that began operating in 1982 and began construction on a second reactor, Angra II.[1288] Construction for a third nuclear power reactor, Angra III, began in 1984, but the work was suspended in 1986.[1289] In 1986, it was revealed that Brazil's military was building a test site for an underground nuclear test and, in 1987, Brazil's president announced that it had successfully enriched uranium, according to Reiss.[1290] But, these nuclear achievements occurred as Argentina and Brazil were moving forward with confidence-building measures that would serve as a foundation for the Brazilian-Argentine Center for Accounting and Control of Nuclear Materials—a bilateral nuclear agreement.

In tandem with its nuclear program, Brazil had moved forward on a missile program. U.S. intelligence assessed that, in 1982, plans reportedly were in place to develop ballistic missiles to carry nuclear weapons.[1291] In December 1985, Brazil was working on the Sonda IV, with a possible range of 600 km, and a space launch vehicle in competition with Argentina's program, according to U.S. intelligence.[1292] Further, the United States was concerned that Brazil's work on a satellite launch vehicle could result in the acquisition of technology for a ballistic missile to carry nuclear weapons.[1293]

The United States had been monitoring Brazil's nuclear program. Without damaging bilateral relations, how might the superpower pressure Brazil in order to discourage a peaceful nuclear explosion and ensure that Brazil did not become a nuclear

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[1287] Ibid., 50.

[1288] "Nuclear Power in Brazil," World Nuclear Association, March 2017, http://www.world-nuclear.org/information-library/country-profiles/countries-a-f/brazil.aspx.

[1289] Ibid.

[1290] Reiss, *Bridled Ambition*, 51.

[1291] Director of Central Intelligence, "Nuclear Proliferation Trends Through 1987," 22.

[1292] Director of Central Intelligence, "Brazil's Changing Nuclear Goals: Motives and Constraints," 7.

[1293] Director of Central Intelligence, "Nuclear Proliferation Trends Through 1987," 22.

exporter outside of the Nuclear Suppliers Group?[1294] Like Argentina, Brazil had reacted poorly in the past to diplomatic pressure over its nuclear program.[1295] Analysis from a 1985 U.S. intelligence assessment illuminated Washington's external management strategy in regards to Brazil and other nuclear threshold states. It noted that Brazil's "refusal to place its indigenous nuclear activities—on which it is apparently concentrating current efforts—under full-scope safeguards" made it "difficult for the United States—or any other nation—to have a major impact on its nuclear policies."[1296] This underscores the idea that the United States saw the nonproliferation regime as a critical tool in its effort to combat nuclear proliferation worldwide, but in the mid-1980s it did not have all of the tools required to further pressure states like Brazil.

Brazil eventually came to Washington's desired position for the country's nuclear program on its own. By 1990, Brazil's improved relations with Argentina driven by the process of establishing a regional nuclear agreement began to have an effect. Paul noted that Brazil saw its regional interests better served by renouncing its nuclear weapons program.[1297] After the military's secret program came to light and a new civilian president came to power in March 1990, Brazil ended its military nuclear program in September.[1298] The end of Brazil's rivalry with Argentina resulted in a decrease in regional nuclear proliferation.

In regards to Brazil's missile program, the United States was able to use the same management tools with Brazil that it had used with Argentina. It began with the Nuclear Capable Missile Technology Transfer Policy in 1982 followed by the Missile Technology Control Regime in 1987.[1299] Nevertheless, by late 1990, Brazil still had not relinquished its ballistic missile and space program.

[1294] Ibid., 22–23.

[1295] Ibid.

[1296] Director of Central Intelligence, "Brazil's Changing Nuclear Goals: Motives and Constraints," 12–13.

[1297] Paul, *Power versus Prudence*, 110.

[1298] Ibid., 109.

[1299] "Profile for Brazil."

Argentina and Brazil took steps to move away from military applications for their nuclear programs in the mid-1980s, culminating with an end to both programs in 1990. While both countries had recently transitioned away from military rule, Paul points out that "the move toward nuclear rapprochement had already begun under military rulers."[1300] Their decision-making is best explained by the fact that there was a reduction in rivalry between the two countries. Furthermore, superpower management best explains Argentina's decision to end its Condor II ballistic missile program in 1990. On balance, however, an improved regional security environment best explains the biggest changes—two countries turning away from pursuing nuclear weapons capabilities.

e. Northeast Asia

In Northeast Asia, this section finds that nuclear proliferation decreased from 1973 to 1990 due to external management. The United States was able to effectively manage regional nuclear proliferation efforts, in large part due to extended deterrence, and prevented nuclear spread during this period. This section highlights that North Korea, South Korea and Taiwan all initially pursued nuclear weapons programs while Japan developed a sophisticated nuclear power industry. Ballistic missile proliferation across the region remained a concern. Nevertheless, South Korea and Taiwan halted their efforts to obtain nuclear weapons and Japan did not attempt to acquire them despite its technological capabilities. Only North Korea seemed to pursue a nuclear weapons capability by the end of the period.

Following World War II, the establishment of its peace constitution and its entry into the NPT in 1976, Japan took advantage of the peaceful uses of nuclear technology and developed an expansive nuclear power industry. Japan began operating the first of several fuel fabrication facilities in 1972 and a pilot reprocessing plant in 1977.[1301] Japan even had developed the technology to produce its own nuclear power reactors by the late

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[1300] Paul, *Power versus Prudence*, 100.

[1301] "Japan's Nuclear Fuel Cycle," World Nuclear Association, August 2017, http://www.world-nuclear.org/information-library/country-profiles/countries-g-n/japan-nuclear-fuel-cycle.aspx.

1970s, which would allow it to become an exporter of nuclear power technology.[1302] Despite Japan's well-developed nuclear power capabilities, it did not pursue nuclear weapons capabilities, although its fuel cycle pursuit raised some concerns about a hedge capability, according to Katsuhisa Furukawa.[1303]

In terms of delivery systems, in February 1970, Japan launched a satellite from a solid-fuel rocket.[1304] Clay Moltz noted that "with this flight, Japan became the first Asian nation to join the space age" and, in addition, it was carried out using indigenous technology.[1305] After this satellite launch, Japan began to rapidly develop rockets for its space program.[1306] The concern remained that Japan might one day use this rocket technology to build long-range missiles. Both the country's nuclear history and its security agreement with the United States seemed to motivate it to follow a general path of nonproliferation support. For example, Japan helped to establish the Missile Technology Control Regime in 1987.

Taiwan became interested in nuclear technology with the launching of the Atoms for Peace program and it signed a nuclear cooperation agreement with the United States in 1955. It began to develop its nuclear capabilities in earnest in the late 1960s as a result of its rivalry with Beijing. Taiwan was home to Chiang Kai-Shek's Nationalist Party, opposed to communist rule in China, beginning in 1949. In 1964, Beijing conducted its first nuclear test. Taiwan signed the NPT as the Republic of China in 1968. According to U.S. intelligence, in 1969, Canada agreed to provide Taiwan with a heavy-water moderated 40MW research reactor with natural uranium fuel suitable for producing

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1302 "Nuclear Power in Japan," World Nuclear Association, May 24, 2017, http://www.world-nuclear.org/information-library/country-profiles/countries-g-n/japan-nuclear-power.aspx.

1303 Katsuhisa Furukawa, "Japan's Nuclear Option," in *Over the Horizon Proliferation Threats*, ed. James J. Wirtz and Peter R. Lavoy, Stanford Security Studies (Palo Alto, CA: Stanford University Press, 2012), 24–26.

1304 "Japan Puts Satellite into Orbit in 5th Try," *New York Times*, February 11, 1970, sec. Archives, https://www.nytimes.com/1970/02/11/archives/japan-puts-satellite-into-orbit-in-5th-try.html.

1305 James Clay Moltz, *Asia's Space Race: National Motivations, Regional Rivalries, and International Risks* (Columbia University Press, 2012), 50.

1306 Ibid.

plutonium.[1307] David Albright and Corey Gray wrote that, in the early 1970s, Taiwan began to build a fuel fabrication plant, a reprocessing capability, and a plutonium chemistry laboratory and to buy uranium from South Africa.[1308] U.S. intelligence judged in 1972 that Taiwan sought the capability to build and test a nuclear weapon.[1309] This nuclear development occurred despite U.S. security guarantees for Taiwan.

In the mid-1970s, the United States began to pressure Taiwan to restrict its nuclear program, according to William Burr.[1310] By 1976, IAEA inspectors had found inconsistencies between Taiwan's declarations and their findings in Taiwan's Institute for Nuclear Energy Research.[1311] The United States and the IAEA intensified their efforts to restrict Taiwan's nuclear efforts. Due to U.S. pressure, Taiwan shut down its research reactor and relinquished the fuel elements, dismantled its reprocessing facilities, and returned U.S.-origin plutonium, according to Albright and Gray.[1312] In addition, Taiwan announced plans to adapt the reactor so it would produce less plutonium, and, in 1985, it began the process of shipping its spent fuel to the United States.[1313] In a final effort to move its nuclear program forward, Taiwan worked to launch a hot cell facility in 1987, according to the Nuclear Threat Initiative.[1314] The report noted that the United States

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[1307] Director of Central Intelligence, "Special National Intelligence Estimate 43–1-72: Taipei's Capabilities and Intentions Regarding Nuclear Weapons Development," November 1972, 2, http://nsarchive.gwu.edu/nukevault/ebb221/T-1a.pdf.

[1308] David Albright and Corey Gay, "Taiwan: Nuclear Nightmare Averted," *Bulletin of the Atomic Scientists* 54, no. 1 (January 1, 1998): 57, https://doi.org/10.1080/00963402.1998.11456811.

[1309] Director of Central Intelligence, "Special National Intelligence Estimate 43–1-72: Taipei's Capabilities and Intentions Regarding Nuclear Weapons Development," 5.

[1310] William Burr, "U.S. Opposed Taiwanese Bomb during 1970s," National Security Archive Electronic Briefing Book (George Washington University, June 15, 2007), http://nsarchive.gwu.edu/nukevault/ebb221/index.htm.

[1311] "Profile for Taiwan."

[1312] Albright and Gay, "Taiwan: Nuclear Nightmare Averted," 59.

[1313] Albright and Gay, 59.

[1314] "Profile for Taiwan."

quickly moved to pressure Taiwan to dismantle the facility and it complied in 1988.[1315] Taiwan seemed to abandon its program completely after this event.[1316]

In regards to nuclear energy, Taiwan set-up a nuclear power infrastructure, operating six nuclear power reactors that came online in the 1970s and 1980s.[1317] Given prior concerns regarding Taiwan's nuclear activities, Taiwan's nuclear power development continued to be scrutinized. Taiwan did not acquire a full nuclear fuel cycle.

In terms of delivery systems, the country possessed short-range ballistic missiles developed in the 1970s.[1318] The United States, however, successfully pressured Taiwan to end the development of the Tien Ma or Sky Horse missile, a missile with a possible range of close to 1000 km, in the early 1980s, according to Dinshaw Mistry.[1319]

Taiwan's regional rivalry with China motivated it to pursue nuclear weapons, but pressure from the United States and the IAEA resulted in an end to Taiwan's nuclear weapons program.[1320] In addition, the United States could offer extended deterrence to Taiwan, mitigating some of its security concerns. External management led to a decrease in Taiwan's nuclear proliferation efforts by the end of the period—both in terms of its nuclear technology and delivery systems.

South Korea expressed interest in nuclear technology around the time of the U.S.-led Atoms for Peace initiative and signed a nuclear cooperation agreement with the United States in 1956. The country joined the IAEA in 1957 and established the Korean Atomic Energy Research Institute in 1959.[1321] South Korea began to pursue a nuclear

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[1315] Ibid.

[1316] Ibid.

[1317] "Nuclear Power in Taiwan," World Nuclear Association, April 2017, http://www.world-nuclear.org/information-library/country-profiles/others/nuclear-power-in-taiwan.aspx.

[1318] "Profile for Taiwan—Missile," Nuclear Threat Initiative, accessed March 24, 2017, http://www.nti.org/learn/countries/taiwan/delivery-systems/.

[1319] Dinshaw Mistry, "Technological Containment: The MTCR and Missile Proliferation," *Security Studies* 11, no. 3 (March 1, 2002): 107, https://doi.org/10.1080/714005342.

[1320] Albright and Gay, "Taiwan: Nuclear Nightmare Averted," 54.

[1321] "Nuclear Power in South Korea," World Nuclear Association, June 20, 2017, http://www.world-nuclear.org/information-library/country-profiles/countries-o-s/south-korea.aspx.

weapons program in the early 1970s, according to the Nuclear Threat Initiative, due to concern over regional threats, particularly those emanating from North Korea, and worries regarding a withdrawal of U.S. troops.[1322] The program began with work in the nuclear power industry and the country's first three nuclear power plants began operating in the late 1970s.[1323] U.S. intelligence reported that South Korea's leadership expanded nuclear weapons efforts and approved secret work on a design for nuclear weapons in 1974, a program called Project 890.[1324] Washington noted that South Korea began negotiations to acquire a fuel-fabrication facility from Belgium, a heavy-water research reactor from Canada, and a reprocessing facility from France.[1325] This occurred before the United States announced the withdrawal of nuclear weapons from South Korea.

The United States became concerned regarding South Korea's nuclear program in the mid-1970s. After India's peaceful nuclear explosion in 1974, however, the United States increased its efforts to stop other states, such as South Korea, from acquiring the ability to produce plutonium from a nuclear power reactor, which could be used for a weapon. According to the U.S. Department of State, the United States began discussions with Canada about halting the sale of the heavy-water research reactor to South Korea, even though the deal was almost complete.[1326] U.S. intelligence noted that once Canada agreed with the U.S. position, the two countries were able to persuade South Korea to drop its plans for the reprocessing facility and fuel-fabrication laboratory.[1327] The United States and South Korea signed the 1974 Korea-U.S. Atomic Energy Agreement, a "123

[1322] "Profile for South Korea."

[1323] "Nuclear Power in South Korea."

[1324] Central Intelligence Agency, "South Korea: Nuclear Developments and Strategic Decisionmaking," June 1978, 7, http://libproxy.nps.edu/login?url=http://search.proquest.com/docview/1679044437?accountid=12702.

[1325] Ibid., 5–6.

[1326] U.S. Embassy, Republic of Korea, "Canadian Nuclear Reactor Program in Korea" (U.S. Department of State, November 4, 1974), https://nsarchive2.gwu.edu/dc.html?doc=3513492-Document-03-U-S-Embassy-in-Republic-of-Korea.

[1327] Central Intelligence Agency, "South Korea: Nuclear Developments and Strategic Decisionmaking," 6.

Agreement," which prohibited uranium enrichment and spent fuel reprocessing.[1328] South Korea signed the NPT in April 1975, which placed additional constraints on its nuclear program, committing the country to the treaty's Safeguards Agreement.

U.S. intelligence reported that South Korea continued to look for ways to advance its nuclear program, opting to try to develop its own reactor and heavy-water production facility along with the military aspects of the program.[1329] The same report noted that, by 1976, South Korea's leadership suspended Project 890.[1330] In 1982, however, South Korea conducted laboratory experiments in which "a 5-pin mini fuel assembly (mini-assembly) containing about 2.5 kg of DU [depleted uranium] had been irradiated for 82 days in the TRIGA III research reactor" reportedly to "study the separation of uranium and plutonium," according to the IAEA.[1331] The IAEA later assessed that South Korea would have been able to obtain small quantities of pure plutonium through these experiments.[1332] The test was not declared to the IAEA, but it was carried out in a facility under safeguards.[1333] In addition, the mini fuel assembly was reported incorrectly to the IAEA as an "unirradiated fuel assembly"[1334] South Korea claimed that these tests were undertaken without the government's knowledge.[1335] Following this incident, concerns regarding South Korea's nuclear program appeared to subside.

Regarding South Korea's nuclear power industry, the country quickly expanded its capabilities during this period. Between 1978 and 1989, nine nuclear power reactors

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1328 "Nuclear Power in South Korea."

1329 Central Intelligence Agency, "South Korea: Nuclear Developments and Strategic Decisionmaking," 6–7.

1330 Ibid., 12.

1331 International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement in the Republic of Korea," November 11, 2004, 5–6, https://www.iaea.org/sites/default/files/gov2004-84.pdf.

1332 Ibid., 6.

1333 Ibid.

1334 Ibid.

1335 Ibid., 2.

began operating in the country.[1336] They were managed by the Korea Electric Power Company, known as KEPCO.

In terms of delivery systems, South Korea worked to develop a missile arsenal in response to the North Korean missile threat. It was constrained, however, by a 1972 agreement with the United States, which limited the range of its missiles to 180 km with a 500 kg payload in exchange for U.S. technology, according to the Nuclear Threat Initiative.[1337] During this period, South Korea developed the NHK-1 and the NHK-2, short-range ballistic missiles that fell within the agreed upon parameters.[1338]

Despite the fact that the United States had stationed nuclear weapons in South Korea, the country pursued a nuclear weapons program in the bipolar period. Nevertheless, U.S. efforts successfully constrained South Korea's nuclear weapons program and missile development. The United States was able to exert control over South Korea's nuclear suppliers, the superpower was aware of South Korea's proliferation activities, and it did not face a difficult tradeoff between foreign policy priorities as it sought to limit South Korea's program. The superpower could offer extended deterrence in order to provide security assurances as South Korea faced regional threats.

North Korea's nuclear program began in the 1950s after the Korean War—a war where North Korea, primarily backed by China and the Soviet Union, fought against South Korea, chiefly supported by the United States. The Soviet Union was closely involved with the beginning of North Korea's nuclear program. The superpower gave assistance to include training North Korea's physicists and technicians and providing an IRT-2000 research reactor as North Korea established its nuclear complex at Yongbyon, according to U.S. intelligence.[1339] China also provided some aid.[1340] In 1977, North

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1336 "Nuclear Power in South Korea."

1337 "Profile for South Korea—Missile," Nuclear Threat Initiative, accessed June 11, 2017, http://www.nti.org/learn/countries/south-korea/delivery-systems/.

1338 Ibid.

1339 Central Intelligence Agency, "North Korea's Nuclear Efforts" (Washington, DC, April 28, 1987), 3, http://nsarchive.gwu.edu/NSAEBB/NSAEBB87/nk08.pdf; "Profile for North Korea."

1340 "Profile for North Korea."

Korea signed a Safeguards Agreement with the IAEA and the Soviet Union, which covered the research reactor. In 1983, U.S. intelligence did not believe that North Korea posed a proliferation threat.[1341]

The country expanded its nuclear program in the 1980s, however, as it pursued a complete nuclear fuel cycle and bomb technology, according to the Nuclear Threat Initiative.[1342] Meanwhile, South Korea was experiencing increased economic growth and prosperity and still seemed to be considering a nuclear weapons program.[1343] Under pressure from the Soviet Union, North Korea joined the NPT in 1985.[1344] The Soviet Union had made joining the NPT a condition for its sale of light water reactors to North Korea. U.S. intelligence reported that North Korea completed a 5 MW(e) nuclear reactor, which could yield plutonium for a nuclear weapon, in 1986.[1345] With this achievement, North Korea began building a 50 MW(e) nuclear reactor in the mid-1980s. U.S. intelligence shifted its North Korea assessment by the late 1980s. The Central Intelligence Agency assessed in 1987 that the country could be developing nuclear weapons.[1346] IAEA testing would later find that North Korea reprocessed plutonium illicitly in 1989 and 1990.[1347] As the Cold War drew to a close, the Soviet Union began to reduce its assistance to North Korea.[1348] And it was not clear that North Korea could advance its nuclear program on its own.

[1341] Central Intelligence Agency, Directorate of Intelligence, "A 10-Year Projection of Possible Events of Nuclear Proliferation Concern," May 1983, 5, http://nsarchive.gwu.edu/NSAEBB/NSAEBB87/nk02.pdf.

[1342] "Profile for North Korea."

[1343] Kongdan Oh, "Korea's Path from Poverty to Philanthropy" (Washington, DC: Brookings Institution, June 14, 2010), https://www.brookings.edu/articles/koreas-path-from-poverty-to-philanthropy/; International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement in the Republic of Korea," 5–6.

[1344] Central Intelligence Agency, "North Korea's Nuclear Efforts," 3.

[1345] Ibid.

[1346] Ibid.

[1347] David Albright, "How Much Plutonium Does North Korea Have?," *Bulletin of the Atomic Scientists* 50, no. 5 (1994): 47.

[1348] James Clay Moltz, "U.S.-Russian Relations and the North Korean Crisis: A Role for the Russian Far East?," *Asian Survey* 45, no. 5 (2005): 722, https://doi.org/10.1525/as.2005.45.5.722.

In terms of delivery systems, North Korea had been a ballistic missile proliferator and exporter since the 1980s.[1349] Joshua Pollack noted that North Korea provided missiles to Egypt, Iran, Libya, Syria, the United Arab Emirates, and Yemen during this period.[1350] North Korea's capabilities started with tactical missiles in the early stages of its missile development and progressed to longer-range missiles initially aided by the Soviet Union and China, according to the Nuclear Threat Initiative.[1351] The U.S. Department of Defense asserted that North Korea and Egypt collaborated closely on Scud-B missile development through reverse-engineering efforts in the early to mid-1980s.[1352] Further, the Nuclear Threat Initiative noted that, in the mid- to late 1980s, North Korea began to develop its version of the Scud-C missile.[1353] The report also asserted that, by the late 1980s, North Korea had begun to develop and test the Nodong missile, an intermediate-range ballistic missile.[1354] By the end of the period, North Korea had built a robust missile program.

The regional security environment seemed to motivate North Korea's proliferation. Due to Russian and Chinese support, the United States did not have the same leverage to rein in North Korea's nuclear and missile efforts. The United States also did not seem to be aware of North Korean nuclear intentions until the late 1980s. Until then, South Korea and Taiwan had appeared to pose greater proliferation threats.

North Korea, South Korea, and Taiwan all pursued nuclear weapons programs between 1973 and 1990. But, South Korea ended its program in 1975 and Taiwan ended its program in 1988 following U.S. pressure to do so combined with U.S. extended deterrence commitments. As regional threats persisted, superpower management of the

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1349 Joshua Pollack, "Ballistic Trajectory: The Evolution of North Korea's Ballistic Missile Market," *Nonproliferation Review* 18, no. 2 (July 2011): 417; "Profile for North Korea—Missile," Nuclear Threat Initiative, accessed March 27, 2017, http://www.nti.org/learn/countries/north-korea/delivery-systems/.

1350 Pollack, "Ballistic Trajectory: The Evolution of North Korea's Ballistic Missile Market," 412.

1351 "Profile for North Korea—Missile."

1352 U.S. Joint Chiefs of Staff, "Egyptian Missile Research" (Washington, DC, December 29, 1985), http://libproxy.nps.edu/login?url=http://search.proquest.com/docview/1679096960?accountid=12702.

1353 "Profile for North Korea—Missile."

1354 Ibid.

region best explained the reduction. In contrast with other world regions, the United States experienced greater success in constraining nuclear proliferation in Northeast Asia in this period. By 1990, of the three countries, only North Korea remained a significant concern.

f. South Asia

In South Asia, nuclear proliferation increased between 1973 and 1990 due to not only conflict and rivalry between India and Pakistan, but also between India and China. India began its nuclear efforts in the 1950s with the Atoms for Peace program. Beginning in the 1960s, India developed an extensive nuclear power program. Motivated by military rival China's nuclear advancements and a conflict-ridden relationship with Pakistan, India used plutonium, from a research reactor acquired from Canada, to conduct a "peaceful nuclear explosion" in 1974.[1355]

The international community had been taken by surprise by the nuclear test. This explosion underscored the lack of control over the nuclear supply chain. William Burr noted that this event prompted the United States to initiate the establishment of the Nuclear Suppliers Group in 1975.[1356] Also, in trying to determine why the 1974 explosion had taken the U.S. intelligence community by surprise, a report assessed that the issue of proliferation had not been given a high enough priority by the U.S. government.[1357]

In addition, the Soviet Union's close relationship with India benefited the latter's nuclear program. The Soviet Union made a deal with India in 1976 to provide heavy water as India was developing its nuclear program seemingly on the heels of the 1974 explosion.[1358] William Potter asserted that a lack of response to India's 1974 explosion

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[1355] "Profile for India—Nuclear."

[1356] Burr, "Declassified Documents Show Henry Kissinger's Major Role in the 1974 Initiative That Created the Nuclear Suppliers Group."

[1357] Chief Product Review Division/Intelligence Community Staff, "IC Responses to Post-Mortem Recommendations," January 15, 1975, 5, http://nsarchive.gwu.edu/NSAEBB/NSAEBB187/IN26.pdf.

[1358] William C. Potter, "The Soviet Union and Nuclear Proliferation," *Slavic Review* 44, no. 3 (1985): 476, https://doi.org/10.2307/2498015.

and Soviet willingness to provide heavy water surprised the United States and its allies.[1359] According to U.S. intelligence, by the mid- to late 1980s, India appeared to have a nuclear weapons capability.[1360]

In terms of delivery systems, India had a sophisticated ballistic missile program and worked to develop long-range ballistic missile capabilities. This included an advanced space program established in the 1960s. By 1980, India had launched a satellite.[1361] During the 1980s, India developed the liquid-fueled Prithvi, a short-range ballistic missile, and the solid-fueled Agni, a medium-range ballistic missile, according to the Nuclear Threat Initiative.[1362]

Pakistan launched its nuclear program in the 1950s and began pursuing nuclear weapons after suffering defeat in its 1971 war with India. Its leadership famously committed to "eat grass" rather than forego nuclear weapons.[1363] The United States expressed concern regarding Pakistan's nuclear program from its beginning and monitored the program's progress. It also monitored China's nuclear assistance to Pakistan, according to Burr.[1364] While the United States pressured its ally Pakistan in order to constrain its nuclear program, it met with little success. The U.S. Embassy in Islamabad noted in a 1979 cable that "no unilateral or multilateral pressure that USG and its friends can mount will persuade Pakistan to forego its efforts to achieve a nuclear explosive capability."[1365]

[1359] Ibid., 474.

[1360] Central Intelligence Agency, Directorate of Intelligence, "Middle East-South Asia: Nuclear Handbook," 13.

[1361] "Profile for India—Missile," Nuclear Threat Initiative, accessed June 15, 2017, http://www.nti.org/learn/countries/india/delivery-systems/.

[1362] Ibid.

[1363] Khan, *Eating Grass*, 7.

[1364] William Burr, "China, Pakistan, and the Bomb: The Declassified File on U.S. Policy, 1977–1997," National Security Archive Electronic Briefing Book (George Washington University, March 5, 2004), http://nsarchive.gwu.edu/NSAEBB/NSAEBB114/.

[1365] U.S. Embassy Islamabad, "Pakistan's Nuclear Program: Hard Choices" (Islamabad, Pakistan: U.S. State Department, March 5, 1979), http://nsarchive.gwu.edu/nukevault/ebb333/doc27.pdf.

China and A.Q. Khan aided Pakistan's nuclear efforts. David Albright noted that A.Q. Khan began working to advance Pakistan's nuclear weapons program in the mid-1970s.[1366] He brought the plans for the more efficient Zippe centrifuge from the Netherlands to Pakistan in 1974 and developed a network to acquire the required materials for nuclear weapons, according to Jeremy Bernstein.[1367] China provided designs for a nuclear weapon along with highly enriched uranium, while A.Q. Khan's work enabled Pakistan to build a gas centrifuge plant.[1368] By 1984, Pakistan had acquired nuclear weapons, according to Albright.[1369] Cirincione, Wolfsthal, and Rajkumar asserted that Pakistan had constructed the cores for several nuclear weapons by the end of the period in 1990.[1370]

Why was Pakistan able to move forward with its nuclear program despite U.S. vigilance and its alliance with the United States? Pakistan had two factors in its favor. First, Pakistan was arguably the greatest benefactor from two suppliers for a number of aspiring nuclear proliferators in the 1980s—China and A.Q. Khan. While both suppliers may have had financial motivations for assisting in the Middle East, the rationale for assisting Pakistan was driven by hard-nosed security concerns and, in the case of A.Q. Khan, nationalism. Second, the United States was also constrained in the pressure that it could apply given Pakistan's role in assisting U.S. efforts against the Soviets in Afghanistan. In 1985, the Central Intelligence Agency judged that Pakistan's leader Mohammed Zia-ul-Haq believed that the critical nature of Pakistan's support to U.S. policy in Afghanistan permitted Pakistan to clandestinely pursue nuclear weapons

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[1366] Albright, *Peddling Peril*, 30.

[1367] Jeremy Bernstein, *One Physicist's Guide to Nuclear Weapons: A Global Perspective* (Bristol, United Kingdom: IOP Publishing, 2016), 6–3.

[1368] Albright, *Peddling Peril*, 9; William Burr, "China May Have Helped Pakistan Nuclear Weapons Design, Newly Declassified Intelligence Indicates," National Security Archive Electronic Briefing Book (George Washington University, April 23, 2013), http://nsarchive.gwu.edu/nukevault/ebb423/.

[1369] Albright, *Peddling Peril*, 9.

[1370] Cirincione, Wolfsthal, and Rajkumar, *Deadly Arsenals*, 245.

technology without risking the loss of U.S. aid.[1371] As in the Middle East, external management of nuclear proliferation was less effective in an environment of heightened competition in the international system.

In terms of delivery systems, Pakistan's missile development program had grown in tandem with its nuclear program. It started a space agency in the early 1960s.[1372] In the late 1980s, Pakistan tested its Hatf-1 and Hatf-2 solid-fueled short-range ballistic missiles, according to the Nuclear Threat Initiative.[1373] Further, China and North Korea provided assistance to Pakistan's missile program. Nevertheless, Cirincione, Wolfsthal, and Rajkumar noted that Pakistan likely would have used F-16 fighter jets, provided by the United States in the bipolar period, as a delivery vehicle for a nuclear weapon.[1374]

While both India and Pakistan tested nuclear devices in May 1998, they seemed to have essentially achieved their nuclear weapons capabilities in the 1980s, according to the information examined here. The same difficulties that applied to superpower management of nuclear proliferation in the Middle East from 1973 to 1990 appeared to pertain to managing the efforts of Pakistan and India. The United States was aware that both countries were interested in pursuing nuclear weapons. Nevertheless, the Cold War environment, characterized in this region by lack of control over the nuclear supply chain and superpower competition, allowed these regional rivals to acquire a nuclear capability under the nose of the superpowers.

g. South Pacific

In the South Pacific, nuclear proliferation decreased due to external management between 1973 and 1990. Australia seemed to have desired to acquire nuclear weapons initially due to the pursuit of this capability by other powers such as France, Italy, and

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[1371] Central Intelligence Agency, Directorate of Intelligence, "Pakistan-United States: Dynamic of the Relatonship," September 1985, iv, http://nsarchive.gwu.edu/nukevault/ebb531-U.S.-Pakistan-Nuclear-Relations,-1984-1985/documents/doc%2016%209-1985%20%20US%20Pakistan%20dynamics.pdf.

[1372] "Profile for Pakistan—Missile," Nuclear Threat Initiative, accessed March 28, 2017, http://www.nti.org/learn/countries/pakistan/delivery-systems/.

[1373] Ibid.

[1374] Cirincione, Wolfsthal, and Rajkumar, *Deadly Arsenals*, 239.

West Germany in the 1950s, according to Jim Walsh.[1375] The country also had been bombed by Japan in World War II and had feared an invasion.[1376] Walsh wrote that Australia negotiated on and off again with the United Kingdom in the 1950s and early 1960s for nuclear warheads and the British government appeared willing to share.[1377] Nevertheless, the United Kingdom hesitated due to the constraints placed on Britain's nuclear technology by the McMahon Act, or the U.S. Atomic Energy Act of 1946, which controlled the sharing of U.S. nuclear technology with third countries.[1378] Walsh asserted that the most serious and domestically unified Australian request to the United Kingdom for nuclear warheads in 1961 resulted in a similar response noting this limitation.[1379]

In the mid-1960s and early 1970s, Australia's primary motivation appeared to be the threat from China after China's first nuclear test in 1964.[1380] The test prompted Australia to pursue the nuclear issue once again and the country sought an indigenous nuclear capability, according to Walsh.[1381] The United States, however, soon began to pressure Australia to integrate itself into the nonproliferation regime. Walsh noted that the United States asked Australia to subject its civilian nuclear program to IAEA safeguards in 1966.[1382] In 1968, the United States reached out to Australia regarding the signing of the NPT. According to the U.S. State Department, Australia pushed back hard and provided many reasons for not signing the treaty.[1383] The United States persisted, however, and Australia eventually signed the treaty in 1970 and ratified it in 1973 with

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[1375] Jim Walsh, "Surprise down under: The Secret History of Australia's Nuclear Ambitions," *Nonproliferation Review* 5, no. 1 (December 1, 1997): 2, https://doi.org/10.1080/10736709708436690.

[1376] Wayne Reynolds and John Simpson, "Australia: A Potential Future Nuclear Proliferator?," in *Forecasting Nuclear Proliferation in the 21st Century: Volume 2, A Comparative Perspective*, ed. William Potter and Gaukhar Mukhatzhanova (Palo Alto, CA: Stanford Security Studies, 2010), 286.

[1377] Walsh, "Surprise down under: The Secret History of Australia's Nuclear Ambitions," 5.

[1378] Ibid., 5.

[1379] Ibid., 8.

[1380] Paul, *Power versus Prudence*, 75.

[1381] Walsh, "Surprise down under: The Secret History of Australia's Nuclear Ambitions," 9.

[1382] Ibid., 10.

[1383] U.S. Embassy Canberra, Embassy Cable (April 6, 1968), http://nsarchive.gwu.edu/nukevault/ebb253/doc16a.pdf.

the understanding that it could count on extended deterrence from the United States.[1384] Walsh surmises "the ratification of the NPT marked a turning point, a decisive step away from nuclear weapons."[1385] According to Wayne Reynolds and John Simpson, U.S. pressure played the key role in bringing the Australian pursuit of nuclear weapons to an end.[1386]

The region as a whole played a significant role in the history of nuclear weapons. The United States, the United Kingdom, and France all conducted nuclear tests in the South Pacific region. The United Kingdom carried out nuclear tests in Australia and on Christmas Island with the United States. The United States conducted the first test in the region at the Bikini atoll in 1946 and continued testing through the early 1960s. The French conducted their first test in the mid-1960s and their last test in 1996. In addition to concerns regarding nuclear testing, the region was wary of nuclear waste dumping.

After Australia's nuclear weapons ambitions came to an end, regional states joined together to form a NWFZ in 1985 and the Treaty of Rarotonga entered into force in 1986. The regional states decided to include a prohibition against nuclear weapons testing in this treaty.[1387] In this sense, the region used the nonproliferation regime, in the form of creating a NWFZ, as a defense mechanism against regional nuclear activities by nuclear weapon states. Furthermore, New Zealand took the additional step of prohibiting all nuclear-armed and nuclear-powered ships from entering the country's ports in 1987.[1388] The United States responded with frustration at its ally's anti-nuclear policy, resulting in a rift between the two countries. Despite U.S. pressure, New Zealand opted to

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[1384] Reynolds and Simpson, "Australia: A Potential Future Nuclear Proliferator?," 290.

[1385] Walsh, "Surprise down under: The Secret History of Australia's Nuclear Ambitions," 13.

[1386] Reynolds and Simpson, "Australia: A Potential Future Nuclear Proliferator?" 290.

[1387] Michael Hamel-Green, "Cooperating Regionally, Denuclearizing Globally: Multilateral Nuclear-Weapon-Free-Zone Initiatives," in *International Cooperation on WMD Nonproliferation*, ed. Jeffrey Knopf (Athens, GA: University of Georgia Press, 2016), 209.

[1388] "New Zealand Enacts Ban on Nuclear Ships," *New York Times*, June 5, 1987, http://www.nytimes.com/1987/06/05/world/new-zealand-enacts-ban-on-nuclear-ships.html.

remain "nuclear-free" as it saw this path as the best way to safeguard its own security.[1389]

Australia's end to its nuclear ambitions signaled a decrease in regional nuclear proliferation. Like the downward proliferation trend in Northeast Asia, U.S. external management drove this decrease. Through diplomatic negotiations and political pressure, one of the superpowers, the United States, succeeded in moving its ally, Australia, to take definitive steps away from a nuclear weapons program. While New Zealand embraced a nuclear-free identity, the country had not seriously pursued a nuclear weapons option like Australia. Thus, external management played a greater role in moving the region away from nuclear weapons pursuits during this period.

h. Southeast Asia

In Southeast Asia, nuclear proliferation decreased from 1973 to 1990. External managers monitored the nuclear power programs of Indonesia and Vietnam for possible nuclear program expansion, while regional states began to lay the groundwork for a NWFZ. The creation of a NWFZ was motivated by a reaction to superpower competition in the region, especially the Vietnam War.[1390]

Indonesia considered a nuclear weapons program in the 1960s, but was unable to advance its nuclear capability. U.S. diplomats assessed that the public statements by Indonesia's leadership exaggerated the country's nuclear capabilities.[1391] In addition, they noted that the Soviet Union and China had demonstrated a lack of interest in providing more than very limited support to Indonesia.[1392] Nevertheless, the country

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[1389] Wade Huntley, "The Kiwi That Roared: Nuclear- Free New Zealand in a Nuclear- Armed World," *Nonproliferation Review* 4, no. 1 (December 1, 1996): 2, https://doi.org/10.1080/10736709608436649.

[1390] Hamel-Green, "Cooperating Regionally, Denuclearizing Globally: Multilateral Nuclear-Weapon-Free-Zone Initiatives," 209.

[1391] U.S. Department of State, Bureau of Intelligence and Research, "Recent Indonesian Statements Concerning Nuclear Weapons," Bureau of Intelligence and Research, Reports Coordination and Review Staff, Intelligence Reports (Washington, DC, July 30, 1965), 1, http://nsarchive.gwu.edu/dc.html?doc=2830719-Document-17-Thomas-L-Hughes-to-the-Secretary.

[1392] Ibid., 3.

acquired the most developed nuclear infrastructure in the region. Indonesia built three research reactors among other nuclear-related facilities.[1393] Any efforts toward a nuclear weapon ended in 1967 with a change in power, according to the Nuclear Threat Initiative.[1394] Indonesia signed the NPT in 1970 and ratified it in 1979. In addition, it expressed an interest in nuclear power beginning in the late 1980s.[1395] Vietnam also developed limited nuclear capabilities. The country has had a nuclear research reactor since 1963.[1396] But, Vietnam joined the NPT in 1982.[1397]

Members of the Association of Southeast Asian Nations, a regional cooperation organization, discussed the idea of a regional NWFZ in the early 1970s and put forward a formal proposal in the mid-1980s.[1398] These states publicly signaled their intent to keep nuclear weapons out of the region in support of economic and security interests. This NWFZ was unique as it was developed in the context of a regional cooperation organization. It was like other regions, however, as the motive for the treaty's creation stemmed from a regional history and identity marked by superpower competition.

i. Analysis

An increase or decrease in regional conflict and rivalry drove nuclear proliferation trends in four world regions between 1973 and 1990. External management drove nuclear proliferation trends in two world regions. More horizontal nuclear proliferation occurred in this time period than in the unipolar or multipolar periods.

The bipolar period was characterized by intense superpower competition that constrained external management of nuclear proliferation in several world regions, to

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1393 "Nuclear Power in Indonesia," World Nuclear Association, August 2016, http://www.world-nuclear.org/information-library/country-profiles/countries-g-n/indonesia.aspx.

1394 "Profile for Indonesia."

1395 "Nuclear Power in Indonesia."

1396 "Profile for Vietnam," Nuclear Threat Initiative, accessed March 22, 2017, http://www.nti.org/learn/countries/vietnam/.

1397 Ibid.

1398 "Southeast Asian Nuclear-Weapon-Free-Zone (SEANWFZ) Treaty (Bangkok Treaty)," Nuclear Threat Initiative, accessed June 27, 2017, http://www.nti.org/learn/treaties-and-regimes/southeast-asian-nuclear-weapon-free-zone-seanwfz-treaty-bangkok-treaty/.

include Africa, Latin America, the Middle East, and South Asia. These were regions where U.S. competition with the Soviet Union contributed to a lack of control over the nuclear supply chain and a lack of information on secret nuclear proliferation activities. Nuclear proliferation concerns were sometimes less of a priority than other foreign policy concerns, primarily when superpower competition exhibited itself in the region. Thus, superpowers balanced nuclear proliferation concerns against their larger goals within the superpower competition, and proliferation concerns sometimes lost.

During this period, the United States used the nonproliferation regime as a tool to try to limit nuclear spread and initiated the creation of additional nonproliferation organizations such as the Nuclear Suppliers Group and the Missile Technology Control Regime. A U.S. National Security Council document from 1977 illustrates this approach. The countries of proliferation concern at that time were listed as Taiwan, South Africa, India, South Korea, Israel, Argentina, and Pakistan.[1399] They were categorized as states that posed a "serious near-term risk of acquiring nuclear weapons, or the fuel cycle facilities needed for a weapons option."[1400] This study indicated the United States was concerned by those states that did not have a bilateral agreement backing-up the IAEA agreement, did not have full scope safeguards, and had not committed to forego conducting peaceful nuclear explosions.[1401]

The weaknesses of the original components of the nonproliferation regime, the Nuclear Nonproliferation Treaty and IAEA Safeguards, became apparent as some states pursued clandestine nuclear weapons programs. U.S.-led initiatives such as the Nuclear Suppliers Group and the Missile Technology Control Regime were designed to fill gaps and loopholes that states had exploited in their secret programs.

The United States did not face the same management limits in Northeast Asia, except with North Korea, and the South Pacific. External management played the most

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[1399] U.S. National Security Council, "Non-Proliferation Country Problems," Background Paper, September 14, 1977, http://libproxy.nps.edu/login?url=http://search.proquest.com/docview/1679047616?accountid=12702.

[1400] Ibid., 1.

[1401] Ibid., 4.

important role in halting the nuclear programs of Taiwan and South Korea in Northeast Asia and Australia in the South Pacific. The trends in these regions more closely align with Kenneth Waltz's idea of superpower management under bipolarity whereby client states respond to superpower pressure to limit or end nuclear proliferation.

Further, this period was characterized by the use of NWFZ treaties as a defensive mechanism by some regions. Regions where nuclear testing had occurred, such as the South Pacific, were motivated to limit nuclear testing and prohibit the dumping of nuclear waste in the regions. They sought to use a NWFZ to shield themselves from nuclear-related activities. The South Pacific NWFZ Treaty opened for signature in 1985 and entered into force in 1986. In these cases, the NWFZ initiatives took root in the region after nuclear weapons efforts by regional states had come to an end.

2. The Unipolar Period: 1991 to 2003

In the unipolar period, external management by the global hegemon, the United States, drove nuclear nonproliferation trends in several regions. Regional nuclear proliferation decreased or did not increase in most regions during this period. Nuclear proliferation decreased in the Middle East, Africa, Central Asia, Europe, Latin America, the South Pacific, and Southeast Asia. Nuclear proliferation increased in Northeast Asia and South Asia. In addition, the African NWFZ treaty was opened for signature in 1996, and the Southeast Asian NWFZ treaty was opened for signature in 1995 and ratified in 1997.

a. Africa

In Africa, nuclear proliferation decreased due to external management. In terms of those African countries that also make-up a part of the Middle East, as discussed previously, Egypt's nuclear capabilities did not change in this time period and Libya decided to dismantle its nuclear weapons program at the very end of the period.

Algeria moved forward with its nuclear ambitions unchecked in the early 1990s as its neighbor Libya continued to pursue nuclear weapons. The pilot fuel-fabrication plant

provided by Argentina's INVAP was nearly completed by 1991.[1402] A second research reactor, the Es Salam reactor built with China's assistance, went critical in 1992, according to the International Institute for Strategic Studies.[1403] The institute also noted that the Es Salam site also hosted facilities for waste-storage, isotope-production, and hot-cell laboratories.[1404] International suspicion was aroused in 1991, however, when it was noted that the Es Salam site had suspiciously large cooling towers for the size of the reactor, according to the Nuclear Threat Initiative.[1405] In addition, Algeria had not yet joined the NPT, the buildings at the site were not safeguarded, and there was heavy security around the facility.[1406] The United States with its European partners moved quickly to limit Algeria's project. William Burr noted that the United States was able to obtain better information from China regarding its assistance to Algeria.[1407] As a result, Algeria brought the reactor under IAEA safeguards and joined the NPT in 1995 and the Treaty of Pelindaba in 1997.[1408]

South Africa's nuclear capabilities continued to decrease during this period, primarily its ballistic missile program. South Africa had announced the end of its nuclear program in the bipolar period after the Soviet threat ended and, by 1991, the country's nuclear weapons program was dismantled and it joined the NPT, according to Paul.[1409] Nevertheless, as Henry Sokolski noted the country continued to move forward with its

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1402 International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran*, 107.

1403 Ibid.

1404 Ibid., 108.

1405 "Profile for Algeria."

1406 Ibid.

1407 William Burr, "The Algerian Nuclear Problem, 1991: Controversy over the Es Salam Nuclear Reactor," National Security Archive Electronic Briefing Book (George Washington University, September 10, 2007), http://nsarchive.gwu.edu/nukevault/ebb228/index.htm.

1408 International Institute for Strategic Studies, *Nuclear Programmes in the Middle East: In the Shadow of Iran*, 110.

1409 Paul, *Power versus Prudence*, 116.

ballistic missile program—a program that could have produced an intercontinental ballistic missile.[1410]

As an external manger, the United States placed economic sanctions on South Africa for importing missile technology and the resulting noncompliance with the Missile Technology Control Regime.[1411] South Africa pushed back on U.S. sanctions. The subsequent negotiations with the United States, emphasizing the economic benefits of ending the ballistic missile program, led to South Africa's renunciation of the program in 1993.[1412] In 1995, South Africa joined the Missile Technology Control Regime. It appeared that without U.S. intervention, South Africa would have continued to advance its missile program. Lingering concerns about its knowledge of nuclear technology combined with an advanced ballistic missile program would have proved worrisome.

Algeria's decision to end its suspected nuclear program and South Africa's decision to end its ballistic missile program are best explained by superpower management of the region. It is not clear that South Africa would have agreed to end its missile program without U.S. pressure. It also seems that Algeria would have continued to quickly advance its nuclear capabilities given similar activities undertaken by its rival Libya.

b. Central Asia

In Central Asia, the region's Cold War history made it more responsive to external management efforts to reduce or eliminate proliferation concerns. Kazakhstan enthusiastically embraced regional nonproliferation initiatives.[1413] The Strategic Arms Reduction Treaty and the U.S. Cooperative Threat Reduction program initiated by U.S.

[1410] Henry Sokolski, "Ending South Africa's Rocket Program: A Nonproliferation Success," Nonproliferation Policy Education Center, August 31, 1993, http://www.npolicy.org/article.php?aid=458&tid=2.

[1411] Ibid.

[1412] Ibid.

[1413] Cirincione, Wolfsthal, and Rajkumar, *Deadly Arsenals*, 368.

Senators Sam Nunn and Richard Lugar in 1991 served as key management tools.[1414] U.S. diplomatic and economic resources complemented the program.[1415] U.S. efforts were complemented by multilateral initiatives such as the Strategic Arms Reduction Treaty, the Lisbon Protocol, and the Almaty Agreement, which moved Europe's Belarus and Ukraine and Central Asia's Kazakhstan toward denuclearization.

In Central Asia, Kazakhstan inherited a large arsenal of nuclear weapons with the fall of the Soviet Union. Of the former Soviet Bloc countries, only Russia and Ukraine had more.[1416] After the breakup of the Soviet Union, Kazakhstan closed the Semipalatinsk test site in 1991. With incentives provided by the United States, Kazakhstan acceded to the NPT in 1994 after signing the Budapest Memorandum. Russia received all of Kazakhstan's nuclear warheads by 1995.[1417] Also, the United States worked with Kazakhstan to greatly reduce its stockpile of highly enriched uranium through the 2000s.[1418]

While it was in Russia's best interest to reduce nuclear capabilities of surrounding states, it was not a foregone conclusion that the newly independent states would relinquish them.[1419] For example, a U.S. Embassy Almaty cable noted in 1992 the view of some in Kazakhstan that "nuclear weapons could enhance the country's security or

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[1414] Defense Threat Reduction Agency, "Nunn-Lugar CTR Scorecard," May 2013, http://www.dtra.mil/Portals/61/Documents/20130501_fy13_ctr-scorecard_slides_may13.pdf; Cirincione, Wolfsthal, and Rajkumar, *Deadly Arsenals*, 366.

[1415] Rose Gottemoeller, "Presidential Priorities in Nuclear Policy," in *Dismantling the Cold War: U.S. and NIS Perspectives on the Nunn-Lugar Cooperative Threat Reduction Program*, ed. John M. Shields and William C. Potter (Cambridge, MA: MIT Press, 1997), 60.

[1416] "Profile for Kazakhstan—Nuclear."

[1417] "Profile for Kazakhstan—Nuclear."

[1418] Ibid.

[1419] U.S. Defense Intelligence Agency, "Ukraine—Nuclear Withdrawal Suspension," March 28, 1992, http://nsarchive.gwu.edu/NSAEBB/NSAEBB447/1992-03-28%20Cable,%20Defense%20Intelligence%20Agency%20Washington,%20Defense%20Intelligence%20Report%20ODB%2027-92,%20Ukraine%20–%20Nuclear%20Withdrawal%20Suspension.PDF; U.S. Embassy Almaty, "Defining American Interests in Kazakhstan," Embassy Cable (U.S. State Department, February 15, 1992), http://nsarchive.gwu.edu/NSAEBB/NSAEBB447/1992-02-18%20Cable,%20American%20Embassy%20Alma%20Ata,%20Defining%20American%20Interests%20in%20Kazakhstan.PDF.

status."[1420] And these were security concerns that have been validated by subsequent history, i.e., Russia's 2014 interference in the Ukraine. Nevertheless, Kazakhstan chose to give-up its nuclear weapons arsenal.

Two factors may have made it easier for this region to decide to denuclearize with U.S. support and eventually form a NWFZ. First, the region had been negatively impacted by radioactive fallout from nuclear testing. These memories persisted beyond Soviet times. There were also fears that the region might be used for tactical nuclear weapon storage.[1421] Second, interactions between U.S. officials and regional officials may have demonstrated a different way of thinking about nuclear proliferation. Glory Duffy notes that "the United States introduced U.S. concerns about nonproliferation – which in many ways reflected the concerns of the international community – into decision-making processes in the NIS."[1422] Regional states began to work together in 1997 for the creation of the Central Asian NWFZ treaty. Also, between gaining independence and 1995 these same regional states ratified the NPT.

U.S. denuclearization initiatives could not have been successful without strong regional support. The region's history during the Cold War motivated these states to pursue denuclearization and begin the process of forming a new identity through a NWFZ.

c. Europe

In Europe, Ukraine and Belarus had played important roles in the Soviet Union's nuclear weapons program. The United States and the Nunn-Lugar Program similarly played a critical role in the denuclearization trend, however, the region's history and search for a new post-Cold War identity allowed the United States to be effective.

[1420] U.S. Embassy Almaty, "Defining American Interests in Kazakhstan."

[1421] Hamel-Green, "Cooperating Regionally, Denuclearizing Globally: Multilateral Nuclear-Weapon-Free-Zone Initiatives," 212.

[1422] Gloria Duffy, "Cooperative Threat Reduction in Perspective," in *Dismantling the Cold War: U.S. and NIS Perspectives on the Nunn-Lugar Cooperative Threat Reduction Program*, ed. John M. Shields and William C. Potter (Cambridge, MA: MIT Press, 1997), 25.

Once Ukraine became independent, it hesitated to give up its large nuclear stockpile of nuclear weapons. In 1992, Ukraine had suspended the withdrawal of its nuclear weapons following a rise in tensions with its relationship with Russia over issues such as Crimea, according to U.S. intelligence.[1423] The United States moved forward in 1993 to work out an agreement with Russia and Ukraine for Ukraine to denuclearize. Ukraine agreed to relinquish its nuclear weapons in 1994. This decision was formalized in the Budapest Memorandums, agreements signed with Belarus, Kazakhstan, and the Ukraine.[1424] The agreements were among Russia, the United Kingdom, the United States, and each newly independent state. The signatories agreed to respect the sovereignty and territorial integrity of these new states and refrain from any threat of nuclear attack or economic coercion.[1425] With these assurances, Ukraine acceded to the NPT in 1994 as a non-nuclear weapon state. It also joined the Missile Technology Control Regime in 1998. By 1996, Ukraine's nuclear warheads had been sent back to Russia, according to the Nuclear Threat Initiative.[1426] The report also noted that, by 2002, Ukraine's nuclear-capable missiles and bombers had been dismantled or destroyed.[1427] Nikolai Sokov asserts that Ukraine's desire to integrate into the West drove its nuclear decisions during this time.[1428]

One relic of the Cold War that the Ukraine did maintain was its nuclear power industry. It continued to rely on and develop nuclear energy. While the Ukraine had

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[1423] U.S. Defense Intelligence Agency, "Ukraine—Nuclear Withdrawal Suspension."

[1424] "Budapest Memorandums on Security Assurances, 1994," Council on Foreign Relations, December 5, 1994, http://www.cfr.org/nonproliferation-arms-control-and-disarmament/budapest-memorandums-security-assurances-1994/p32484.

[1425] Polina Sinovets, "Assessing the Ban Treaty from Ukraine," *Bulletin of the Atomic Scientists*, December 16, 2016, http://thebulletin.org/can-treaty-banning-nuclear-weapons-speed-their-abolition/assessing-ban-treaty-ukraine.

[1426] "Profile for Ukraine—Nuclear."

[1427] Ibid.

[1428] Nikolai Sokov, "Ukraine: A Postnuclear Country," in *Forecasting Nuclear Proliferation in the 21st Century: Volume 2 A Comparative Perspective*, ed. William Potter and Gaukhar Mukhatzhanova (Palo Alto, CA: Stanford Security Studies, 2010), 281.

halted its nuclear power program after the 1986 Chernobyl accident, by the mid-1990s, the country signaled its willingness to move forward again.[1429]

Belarus also participated in Cooperative Threat Reduction. The nuclear-armed ballistic missiles and tactical nuclear weapons that it had hosted were returned to Russia as part of the program. In 1993, Belarus acceded to the NPT as a non-nuclear weapon state. Belarus maintained a stockpile of highly enriched uranium, however, provided by the Soviet Union during the Cold War for its nuclear research reactor.[1430] This was only partially removed.[1431] Belarus maintained a closer relationship with Russia than Ukraine.[1432] Thus, it may have been less hesitant to relinquish its nuclear capabilities.

Nuclear spread in Europe decreased due to the elimination or transfer of nuclear weapons and material and delivery systems in states that had been allied with or a part of the former Soviet Union.[1433] Paul Walker noted that between Belarus, Ukraine, and Kazakhstan, there had been over 2,300 warheads and 361 missiles.[1434] The desire to move away from its Cold War past filled with the threat of nuclear war allowed external efforts to be effective. Working with Russia, European allies, and the former Soviet states, the United States as external manager provided financial incentives and organizational support for denuclearization.

d. Latin America

Nuclear proliferation decreased due to external management in Latin America from 1991 to 2003. Argentina and Brazil had renounced nuclear weapons in the prior bipolar period. The Brazilian-Argentine Center for Accounting and Control of Nuclear Materials was established in 1991 to verify their peaceful intent. Furthermore, Argentina

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1429 "Profile for Ukraine—Nuclear."

1430 "Profile for Belarus."

1431 Ibid.

1432 Sokov, "Ukraine: A Postnuclear Country," 255.

1433 Defense Threat Reduction Agency, "Nunn-Lugar CTR Scorecard."

1434 Paul F. Walker, "Cooperative Threat Reduction in the Former Soviet States: Legislative History, Implementation, and Lessons Learned," *Nonproliferation Review* 23, no. 1–2 (March 3, 2016): 116, https://doi.org/10.1080/10736700.2016.1178442.

and Brazil signed the Quadripartite Agreement with the IAEA in 1991 that would apply safeguards to the countries' programs. Both countries, however, held fast to their ballistic missile programs. In contrast to the previous period, external management drove this downward trend.

In Argentina, the United States used both bilateral and multilateral means to pressure the country to end its Condor II program. The superpower had been especially concerned about the program's links to Egypt and Iraq. At the bilateral level, U.S. officials raised the topic of ending the program in meetings with the country's president, according to the Nuclear Threat Initiative.[1435] At the multilateral level, Argentina's program was targeted by the Missile Technology Control Regime, established in 1987.[1436] Argentina announced that it would end the Condor II program in mid-1991.

After the end of the Condor II program, Argentina further integrated itself into the nonproliferation regime. In 1992, the country signaled it would ensure its exports complied with Missile Technology Control Regime rules.[1437] It joined the regime in 1993. Subsequently, Argentina joined the region's NWFZ treaty and the Nuclear Suppliers Group in 1994 and the NPT in 1995.

Brazil was subjected to similar U.S. tactics and pressure to persuade it to give up its advanced ballistic missile program. Savita Pande noted that U.S. pressure "linked to the availability of economic aid, in the form of investment and technology."[1438] In a multilateral context, Brazil became a focus of the Missile Technology Control Regime.[1439] Brazil agreed to give up its missile program in late 1994.

Brazil also integrated itself into the nonproliferation regime at the beginning of the period. It joined the regional NWFZ treaty in 1991, the Missile Technology Control Regime in 1995, the Nuclear Suppliers Group in 1996, and the NPT in 1998.

1435 "Profile for Argentina—Missile."

1436 Ibid.

1437 Pande, "Missile Technology Control Regime: Impact Assessment," 933.

1438 Ibid.

1439 "Profile for Brazil."

While Argentina and Brazil had moved forward to end their nuclear programs in the 1980s, there was no parallel effort with the ballistic missile programs. Seemingly, they would have preferred to maintain their missile programs. Rather, it appeared that U.S. political pressure and accompanying economic incentives along with pressure from the Missile Technology Control Regime motivated Argentina and Brazil to bring these programs to a close. For example, the regime compelled Argentina's European missile suppliers, such as France, Italy, and West Germany, to end their support for the Condor II program, according to the Nuclear Threat Initiative.[1440]

e. Northeast Asia

In Northeast Asia, nuclear proliferation did not decrease despite vigorous external management efforts. These endeavors included the U.S.-North Korean bilateral nuclear agreement, the Agreed Framework, and the multilateral Korean Peninsula Energy Development Organization, which implemented the nuclear agreement. The United States also continued to provide extended deterrence to its regional allies. And, unlike Pakistan and India, it was not clear that North Korea, the regional program of highest concern, had acquired a nuclear weapons capability. North Korea's nuclear program had not been a strong security focus for the United States during the bipolar period, but this changed in the unipolar period.

Japan continued to develop its nuclear power industry and its nuclear power reactors produced a stockpile of plutonium. Due to growing international concern regarding a possible nuclear hedge, in the early 1990s, Japan committed to provide more insight into its stockpile levels through annual reports and a commitment to reduce this stockpile, according to the Nuclear Threat Initiative.[1441] In the mid-1990s, Japan began to look at ways to maximize its use of fuel and how to reprocess used fuel, previously done in Europe.[1442] In 1997, Japan began operating a commercial uranium enrichment

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1440 "Argentina Missile Chronology," Nuclear Threat Initiative, accessed August 20, 2017, https://www.nti.org/media/pdfs/argentina_missile.pdf?_=1316466791.

1441 "Profile for Japan—Nuclear," Nuclear Threat Initiative, accessed June 2, 2017, http://www.nti.org/learn/countries/japan/nuclear/.

1442 "Japan's Nuclear Fuel Cycle."

plant.[1443] In 2002, Japan took measures to increase its domestic use of nuclear power in order to reduce the country's overall greenhouse gas production.[1444] Japan also began to explore exporting nuclear power technology in this period.[1445]

In terms of delivery systems, the Nuclear Threat Initiative noted that Japan launched the M-5 rocket in 1995 that used technology that could be utilized for an intercontinental ballistic missile.[1446] Nevertheless, there was no indication that Japan intended to do so. Rather, North Korea's 1998 test of a Taepodong-1 missile motivated Japan to begin investigating possible missile defense options with the United States, according to Masako Toki.[1447] Toki further noted that, in December 2003, Japan's government approved the establishment of a ballistic missile defense system.[1448]

Taiwan did not pursue nuclear weapons capabilities in the unipolar period, but, in the mid-1990s, Taiwan began developing more advanced missiles in response to Chinese security developments, according to Arthur Ding.[1449] In particular, the Taiwan Strait Crisis in 1995 to 1996, resulting in an escalation of tensions between the United States and China, motivated Taiwan to improve its missile capabilities.[1450] This crisis prompted public statements by politicians regarding the possibility of resurrecting Taiwan's nuclear program, but no concrete actions were taken.[1451] Subsequent to the Taiwan Strait Crisis, Taiwan invested in U.S. missile defense capabilities, according to the Nuclear Threat

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[1443] Ibid.

[1444] "Nuclear Power in Japan."

[1445] "Japan's Nuclear Fuel Cycle."

[1446] "Profile for Japan—Missile," Nuclear Threat Initiative, accessed March 24, 2017, http://www.nti.org/learn/countries/japan/delivery-systems/.

[1447] Masako Toki, "Missile Defense in Japan," *Bulletin of the Atomic Scientists*, January 16, 2009, http://thebulletin.org/missile-defense-japan.

[1448] Ibid.

[1449] Arthur S. Ding, "Will Taiwan Go Nuclear?," in *Over the Horizon Proliferation Threats*, ed. James J. Wirtz and Peter R. Lavoy, First Edition (Palo Alto, CA: Stanford Security Studies, 2012), 34; "Profile for Taiwan—Missile."

[1450] "Profile for Taiwan—Missile."

[1451] Derek J. Mitchell, "Taiwan's Hsin Chu Program: Deterrence, Abandonment, and Honor," in *The Nuclear Tipping Point: Why States Reconsider Their Nuclear Choices*, ed. Kurt M. Campbell, Robert J. Einhorn, and Mitchell B. Reiss (Washington, DC: Brookings Institution Press, 2004), 308.

Initiative.[1452] The report also noted that Taiwan sought to improve its indigenous short-range ballistic missile capability. Taiwan restarted the Tien Ma solid-fueled missile program it had ended in the 1980s.[1453] It tested the Tien Chi missile in 1997 and the Hsiung Feng III anti-ship missile in 1998—both solid-fueled missiles.[1454] Nevertheless, Taiwan did not appear to move beyond short-range ballistic missiles. In terms of nuclear power, Taiwan began building two more nuclear power reactors in 1999, but they had not been completed by the end of the period.[1455]

After the fall of the Soviet Union, the United States worked to denuclearize and to de-escalate tensions on the Korean peninsula. As part of negotiations with North and South Korea, the United States removed its nuclear weapons from South Korea in 1991 and the two Koreas signed the "Joint Declaration on the Denuclearization of the Korean Peninsula" in January 1992.[1456] The United States would now provide nuclear deterrence from afar. Unlike the bilateral inspection regime between Argentina and Brazil, however, this one was not successfully implemented. Nevertheless, South Korea continued to support U.S. efforts to constrain North Korea's nuclear and missile activities throughout the period. South Korea played a critical role in implementing the Agreed Framework, especially through its role with the Korean Peninsula Energy Development Organization. And, in 2003, South Korea served as a key member of the Six-Party Talks.

Nevertheless, one suspicious incident occurred. According to the IAEA, in 2000, South Korea used atomic vapor laser isotope separation to enrich 200 mg of uranium, and the country reported the experiments to the IAEA several years later.[1457] The IAEA reported that around 10 tests involving uranium were carried out using the laser

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[1452] "Profile for Taiwan—Missile."

[1453] Ibid.

[1454] "Profile for Taiwan."

[1455] "Nuclear Power in Taiwan."

[1456] "Profile for South Korea."

[1457] International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the NPT Safeguards Agreement in the Republic of Korea," 1.

technology between 1993 and 2000.[1458] This gave cause for the United States and the IAEA to continue to carefully scrutinize South Korea's program. South Korea complied with the IAEA and did not seem to undertake further nuclear-weapons related activities in this period.

After North Korea's Taepodong-1 missile test in 1998, South Korea became alarmed by the gap in missile capabilities between the two countries, according to Moltz.[1459] South Korea decided to advance its space program, particularly its satellite and rocket programs.[1460] Jonathan Pollack and Mitchell Resiss noted that South Korea also lobbied the United States to expand the range of missile that it was allowed to build to 300 km.[1461] By 2000, South Korea's space program had progressed enough that it could advance plans for a space launch vehicle.[1462] In 2001, South Korea was granted membership in the Missile Technology Control Regime, which also allowed the country to access additional missile technology.[1463] This regime limited its members to ballistic missiles with a range of 300 km and a payload of 500 kg. The United States and South Korea renegotiated their bilateral agreement in order to accommodate South Korean development of missile ranges and payloads permitted by the regime.[1464]

South Korea had a sophisticated and well-developed nuclear power industry and relied heavily on nuclear power to satisfy its energy requirements. During this period, nine additional nuclear power reactors entered into operation.[1465] In regard to the

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[1458] Ibid., 3.

[1459] Moltz, *Asia's Space Race*, 144.

[1460] Ibid.

[1461] Jonathan D. Pollack and Mitchell B. Reiss, "South Korea: The Tyranny of Geography and the Vexations of History," in *The Nuclear Tipping Point: Why States Reconsider Their Nuclear Choices*, ed. Kurt M. Campbell, Robert J. Einhorn, and Mitchell B. Reiss (Washington, DC: Brookings Institution Press, 2004), 273.

[1462] Moltz, *Asia's Space Race*, 145.

[1463] Ibid.

[1464] "Profile for South Korea—Missile."

[1465] "Nuclear Power in South Korea."

country's overall fuel cycle, however, it remained limited by the 1974 Korea-U.S. Atomic Energy Agreement that prohibited uranium enrichment and fuel reprocessing.[1466]

South Korea did not advance its nuclear capabilities in a significant way that would demonstrate pursuit of a nuclear weapons program, but the undeclared experiments served as a reminder of South Korea's nuclear endeavors during the bipolar period and of the need to closely monitor the country's nuclear program.

In North Korea, it appeared that the United States might be able to limit or even halt nuclear proliferation. Despite U.S. efforts, however, North Korea advanced its nuclear program. The decade began with North Korea appearing to cooperate with inspection efforts. The United States had removed its nuclear weapons from South Korea as North Korea had insisted that it would not consent to IAEA inspections of its nuclear facilities until this was done.[1467] After North Korea and South Korea signed the "Joint Declaration on the Denuclearization of the Korean Peninsula," banning the enrichment of uranium and reprocessing of plutonium, North Korea signed an IAEA Safeguards Agreement and provided its required declaration of facilities.[1468] The IAEA began inspections in May 1992. Albright noted that IAEA testing found that North Korea had reprocessed plutonium illicitly in 1991 (and 1989 and 1990).[1469]

North Korea never fully cooperated, however, with IAEA inspectors. Leon Sigal wrote that, in November 1992, North Korea refused to provide samples of the spent fuel rods to the IAEA.[1470] In February 1993, North Korea did not allow the IAEA to visit two nuclear waste sites, according to the Arms Control Association.[1471] In March, North

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[1466] Ibid.

[1467] David E. Rosenbaum, "U.S. to Pull A-Bombs from South Korea," *New York Times*, October 20, 1991, http://www.nytimes.com/1991/10/20/world/us-to-pull-a-bombs-from-south-korea.html.

[1468] U.S. Department of State, Bureau of Public Affairs, "Joint Declaration of the Denuclearization of the Korean Peninsula," accessed June 30, 2017, https://2001-2009.state.gov/t/ac/rls/or/2004/31011.htm.

[1469] Albright, "How Much Plutonium Does North Korea Have?" 47.

[1470] Leon V. Sigal, "The North Korean Nuclear Crisis: Understanding The Failure of the 'Crime-and-Punishment' Strategy," *Arms Control Today*, May 1, 1997, https://www.armscontrol.org/act/1997_05/sigal.

[1471] "Chronology of U.S.-North Korean Nuclear and Missile Diplomacy," Arms Control Association, June 2017, https://www.armscontrol.org/factsheets/dprkchron.

Korea advised that it would leave the NPT in 90 days, but halted the withdrawal process just short of it being implemented.[1472] Sigal noted that, in August, IAEA inspections showed that two of three cells at a hot cell access point had been disturbed or broken.[1473] In October, North Korea suspended its consultation with the IAEA. In December, North Korea agreed to IAEA inspections at its nuclear sites, but restricted access in the research reactor and reprocessing plant, according to Sigal.[1474] Furthermore, he noted that, in January 1994, North Korea refused to agree to the IAEA's inspection list, and, in March, North Korea blocked access at a hot cell by not permitting inspectors to take smear samples.[1475] He added that it obstructed routine inspections and fuel rod analysis and, in May, North Korea announced it would begin removing spent fuel from its reactor.[1476] In June, North Korea withdrew from its IAEA membership, but the Safeguards Agreement remained in place.[1477]

In June 1994, former U.S. President Jimmy Carter went to North Korea and laid the groundwork for negotiations between the United States and North Korea, which would lead to the October 1994 Agreed Framework. The Agreed Framework represented significant progress toward containing North Korea's nuclear program. Under the agreement, North Korea agreed to freeze operation and construction of its nuclear reactors, dismantle the reactors, and store the spent fuel.[1478] For its part, the United States agreed to build two light-water reactors on a credit basis from South Korea for power generation and heavy heating oil until the reactors were completed.[1479] Under the agreement, North Korea would have twenty years to pay back the money borrowed from

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1472 "Profile for North Korea."

1473 Sigal, "The North Korean Nuclear Crisis: Understanding the Failure of the 'Crime-and-Punishment' Strategy."

1474 Ibid.

1475 Ibid.

1476 "Chronology of U.S.-North Korean Nuclear and Missile Diplomacy."

1477 Ibid.

1478 "The U.S.-North Korean Agreed Framework at a Glance," Arms Control Association, August 2004, https://www.armscontrol.org/factsheets/agreedframework.

1479 Ibid.

South Korea. Both parties moved forward to implement the 1994 Agreed Framework. The Korean Peninsula Energy Development Organization, founded by the United States, South Korea, and Japan—and later joined by European partners—administered the agreement for the light-water reactors and the fuel oil. In December 2001, the U.S. intelligence community reported that North Korea's spent fuel rods had been safely stored.[1480] The canning of the spent fuel was supervised by the U.S. Department of Energy. Between November 1994 and December 2002, the IAEA monitored the agreed upon freeze of North Korea's nuclear reactor.[1481] This was the closest that the United States, as an external manager, came to halting North Korea's nuclear program.

North Korea's nuclear capability, however, was already significant and its intentions to acquire a weapon did not appear to waver. According to U.S. intelligence, North Korea had already generated sufficient plutonium for a minimum of one nuclear weapon prior to the 1994 agreement.[1482] In addition, according to David Sanger, in 1997 or 1998, North Korea reportedly decided to advance a project to build a nuclear weapon from highly enriched uranium using centrifuges provided by Pakistan.[1483]

In terms of a delivery system, North Korea continued to advance its ballistic missile program in the 1990s following the 1994 nuclear agreement, which did not restrict missiles. The United States worked to constrain North Korea's missile development, especially by pressuring it to join the Missile Technology Control Regime. After a 1998 intermediate-range ballistic missile test, which failed to launch a satellite due to the failure of the rocket's third stage, North Korea agreed to a freeze on long-range

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[1480] Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, July–December 2001."

[1481] International Atomic Energy Agency, Board of Governors, Director General, "Implementation of the Safeguards Agreement Between the Agency and the Democratic People's Republic of Korea Pursuant to the Treaty on the Non-Proliferation of Nuclear Weapons," General Conference, August 4, 2005, 1, https://www.iaea.org/About/Policy/GC/GC49/Documents/gc49-13.pdf.

[1482] Director of Central Intelligence, "Report of Proliferation-Related Acquisition in 1997."

[1483] David E. Sanger, "In North Korea and Pakistan, Deep Roots of Nuclear Barter," *New York Times*, November 24, 2002, http://www.nytimes.com/2002/11/24/world/threats-responses-alliances-north-korea-pakistan-deep-roots-nuclear-barter.html.

missile testing in 1999.[1484] North Korea observed the testing moratorium pending talks with the United States regarding North Korea's missile program. The talks did not materialize, however, due to the end of U.S. President Bill Clinton's time in office.

The administration of U.S. President George W. Bush took a more confrontational approach to North Korea's nuclear and missile program when it came into office in 2001. This included labeling North Korea a part of an "axis of evil" along with Iran and Iraq in the 2002 State of the Union address. In December 2001, the U.S. intelligence community reported that North Korea sought to acquire equipment related to centrifuges and uranium feed and withdrawal systems.[1485] The intelligence community was certain by mid-20002 that the country was working to build a centrifuge facility.[1486]

Tensions increased between the United States and North Korea. In October, Assistant Secretary of State for East Asian and Pacific Affairs James Kelly traveled to North Korea, reporting afterward that North Korea had admitted to a secret uranium enrichment program, a violation of the Agreed Framework, according to the Council on Foreign Relations.[1487] North Korea contested the accusations. The Korean Peninsula Energy Development Organization ended its heavy fuel oil shipments to North Korea.[1488] On December 9, the U.S. Navy intercepted Scud missiles en route from North Korea to Yemen, according to Gittings, Goldenberg, and Whitaker.[1489] Without an international agreement that made the shipment illegal, the United States had to allow it

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1484 "Profile for North Korea—Missile"; Moltz, *Asia's Space Race*, 170.

1485 Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, July–December 2001."

1486 Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, July–December 2002."

1487 "The Six Party Talks on North Korea's Nuclear Program," Council on Foreign Relations, September 30, 2013, http://www.cfr.org/proliferation/six-party-talks-north-koreas-nuclear-program/p13593.

1488 "Profile for North Korea."

1489 John Gittings, Suzanne Goldenberg, and Brian Whitaker, "Sailing On, the Ship with a Hold Full of Scud Missiles," *The Guardian*, December 12, 2002, https://www.theguardian.com/world/2002/dec/12/yemen.northkorea.

to continue on to its destination. This incident provided the incentive for the creation of the Proliferation Security Initiative by the United States, according to the Nuclear Threat Initiative.[1490] On December 12, North Korea declared that it would resume the operation of its nuclear reactor and it expelled the IAEA inspectors.[1491] In early 2003, the IAEA Board of Governors condemned North Korea's actions and North Korea responded by withdrawing from the NPT and taking out the canned fuel.[1492] In February, the IAEA referred the country to the UN Security Council.[1493]

Initial negotiations between the United States, China, and North Korea began in April 2003. The Six-Party Talks, adding Russia, South Korea, and Japan, were launched in August 2003 to negotiate an end to this second nuclear crisis. North Korea demonstrated how much and how quickly it was willing to escalate the nuclear issue. It asserted in August that it might "transfer" or "demonstrate" its nuclear weapons, according to U.S. intelligence.[1494] U.S. intelligence noted that, in October, North Korea claimed that it had reprocessed all of the previously safeguarded fuel rods and that it threatened to reprocess spent fuel in the future once the nuclear reactor produced more plutonium.[1495] In December, North Korea backed down, saying it would not carry out these activities in exchange for "rewards," according to U.S. intelligence.[1496]

From 1990 to 2003, North Korea appeared to be halting its nuclear weapons advancements with the 1994 Agreed Framework. But North Korea never fully complied and by the late 1990s it seemed to be pursuing centrifuge equipment for uranium enrichment. If the 1994 agreement would have held, North Korea might have joined the ranks of Iraq and Libya, which denuclearized during the unipolar period. This region

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1490 "Proliferation Security Initiative (PSI)."

1491 "Chronology of U.S.-North Korean Nuclear and Missile Diplomacy."

1492 Ibid.

1493 Ibid.

1494 Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, July–December 2003," 5.

1495 Ibid.

1496 Ibid.

could have experienced a decrease in nuclear proliferation like the Middle East. North Korea's nuclear activities, however, did motivate the United States to refine the nuclear nonproliferation regime by adding the Proliferation Security Initiative in May 2003.[1497]

Northeast Asia remained a region characterized by high levels of conflict and rivalry. The closest that the United States came to halting North Korea's nuclear advancement was through the 1994 Agreed Framework in which the U.S. Department of Energy canned the plutonium North Korea had already generated, which halted the reactor's plutonium production. The United States used similar strategies and tactics as it had in other regions to get North Korea to give up its nuclear program, but it was not successful in the way it was in other regions such as the Middle East.

The difference between North Korea and Libya or Iraq in the unipolar period may have been that the United States did not have as much leverage over North Korea. With two nuclear weapon states as neighbors that at one time or another had allied with North Korea, the United States may have been more cautious about its approach. Thus, the support of regional actors may have been more relevant for both crafting and implementing an agreement in the regional security environment. These actors would include: Russia, China, South Korea, and Japan.[1498]

f. South Asia

In South Asia, nuclear proliferation increased due to regional conflict and rivalry. As discussed previously, both India and Pakistan had the ability to produce nuclear weapons by the end of the Cold War. In January 1992, Central Intelligence Agency Director Robert Gates testified to Congress that both Pakistan and India had nuclear weapons and ballistic missile programs along with the capacity to assemble nuclear

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[1497] U.S. Department of State, Bureau of International Security and Nonproliferation, "Background: Proliferation Security Initiative," accessed April 7, 2017, https://www.state.gov/t/isn/c10390.htm.

[1498] Moltz, "U.S.-Russian Relations and the North Korean Crisis: A Role for the Russian Far East?" 735.

weapons quickly that could be delivered by military aircraft.[1499] The two states conducted multiple underground nuclear weapons tests in 1998.

India continued to expand its nuclear weapon and ballistic missile capabilities. It did not sign the Comprehensive Test Ban Treaty negotiated in 1996 and then tested five nuclear weapons in May 1998.[1500] India's nuclear weapons program remained under civilian control, however, and the country established a "no first use" nuclear weapons policy. After the 1998 tests, the United States imposed sanctions on India. It lifted these sanctions after the September 11, 2001 terrorist attacks by Al-Qaeda, however, as the superpower needed India's cooperation in combatting terrorism.[1501] India remained outside of the NPT, the Missile Technology Control Regime, and the Comprehensive Test Ban Treaty.

In regard to delivery systems, India obtained missile technology from Western Europe and Russia, according to U.S. intelligence.[1502] Nevertheless, Clay Moltz noted that the demise of the Soviet Union had a negative effect on India's space program as it became harder for India to obtain "critical hardware and experience" from Russia and Russia was more sensitive to U.S. pressure to comply with the Missile Technology Control Regime.[1503] Daniel Sneider reported that, in one case, U.S. pressure on Russia to comply with Missile Technology Control Regime guidelines caused Russia to cancel a deal to provide cryogenic engine technology to India in 1993.[1504]

1499 *Weapons Proliferation in the New World Order*, Hearings before the Committee on Governmental Affairs, Senate, 102nd Congress, 12 (1992) (testimony of Robert M. Gates, the Director of Central Intelligence).

1500 Cirincione, Wolfsthal, and Rajkumar, *Deadly Arsenals*, 221.

1501 Moltz, *Asia's Space Race*, 123.

1502 Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, July-Dec 1999"; Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, January–June 1999."

1503 Moltz, *Asia's Space Race*, 120.

1504 Daniel Sneider, "Russians Up in Arms about Cancellation of Rocket Deal," *Christian Science Monitor*, July 27, 1993, https://www.csmonitor.com/1993/0727/27072.html.

Nevertheless, India gradually expanded the breadth of its ballistic missile capabilities. In 1991, India launched the Sagarika program to develop a submarine-launched short-range ballistic missile, according to Cirincione, Wolfsthal, and Rajkumar.[1505] They noted that India temporarily halted the Agni I medium-range ballistic missile program in 1994 due to U.S. pressure, but restarted the program in 1998 and began working on the Agni II medium-range ballistic missile.[1506] In addition, India tested the Agni II medium-range ballistic missile in 1999 and 2001, conducted a successful flight test of the Dhanush sea to surface missile in 2001, and tested the Privthi II short-range ballistic missile in 2001, according to Cirincione, Wolfsthal, and Rajkumar.[1507] India's nuclear weapons and ballistic missile activities motivated Pakistan to advance its capabilities as well.

Pakistan increased its nuclear weapons capabilities throughout the period. Cirincione, Wolfsthal, and Rajkumar noted that, after the Soviets exited Afghanistan, the United States began to pressure Pakistan regarding its nuclear program, restricting U.S. aid and military sales to the country in the early 1990s.[1508] In response, they asserted that Pakistan froze its production of weapons-grade uranium, but advanced other aspects of its program such as production of low enriched uranium and plutonium throughout the 1990s.[1509]

Pakistan was able to find suppliers for both its nuclear weapons program and ballistic missile program. In addition to assistance from the A.Q. Khan network, China continued to assist Pakistan with developing its nuclear weapons program and ballistic missile program through the mid-1990s, according to U.S. intelligence.[1510] Washington

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[1505] Cirincione, Wolfsthal, and Rajkumar, *Deadly Arsenals*, 230.

[1506] Ibid., 229.

[1507] Ibid.

[1508] Ibid., 245.

[1509] Ibid.

[1510] Director of Central Intelligence, "The Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions: July–December 1996."

noted that North Korea aided Pakistan's missile program as well.[1511] According to U.S. intelligence, China agreed in 1996 to end its support to nuclear facilities in Pakistan that were not under IAEA Safeguards.[1512] Pakistan then relied on other countries to be nuclear suppliers, primarily countries in Western Europe, according to U.S. intelligence.[1513]

Pakistan did not integrate itself into the nonproliferation regime and worked to establish itself as a nuclear weapon state. Foreshadowing the country's nuclear weapons tests in 1998, Pakistan refused to sign the Comprehensive Test Ban Treaty negotiated in 1996 and conducted underground nuclear weapons tests. It tested five nuclear devices in May 1998 following India's five tests.[1514] The United States imposed sanctions on Pakistan. These sanctions along with other nuclear-related sanctions implemented in 1979 were removed in 2001 as Pakistan cooperated with the United States' post-9/11 counterterrorism efforts.[1515] Like India, Pakistan remained outside of the NPT, the Comprehensive Test Ban Treaty, and the Missile Technology Control Regime.

In terms of delivery systems, Pakistan quickly advanced its missile capabilities in the late 1990s. Pakistan tested two short-range ballistic missiles – the Hatf III in 1997 and the Hatf IV or Shaheen I in 1999, according to Cirincione, Wolfsthal, and Rajkumar.[1516] They further noted that Pakistan increased production of the Hatf IV in 2001.[1517] Pakistan tested several medium-range ballistic missiles as well. They included the Ghauri

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[1511] Director of Central Intelligence, "Report of Proliferation-Related Acquisition in 1997."

[1512] Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, January–June 1999."

[1513] Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, July-Dec 1999."

[1514] Cirincione, Wolfsthal, and Rajkumar, *Deadly Arsenals*, 246.

[1515] Alex Wagner, "Bush Waives Nuclear-Related Sanctions on India, Pakistan," Arms Control Association, October 1, 2001, https://www.armscontrol.org/act/2001_10/sanctionsoct01.

[1516] Cirincione, Wolfsthal, and Rajkumar, *Deadly Arsenals*, 251.

[1517] Ibid., 252.

I, tested in 1998, the Ghauri II, tested in 1999, and the Ghauri III, tested in 2000, according to Cirincione, Wolfsthal, and Rajkumar.[1518]

According to Cirincione, Wolfsthal, and Rajkumar, Pakistan relied on China and North Korea for missile assistance until the mid-1990s, but as assistance from China became more limited, Pakistan turned to North Korea.[1519] In addition, they noted that suspicions that North Korean missile technology at this time "was provided in return for Pakistan's assistance with gas-centrifuge uranium enrichment technology" persist in regards to Pakistan's Ghauri missile capabilities.[1520]

India and Pakistan had acquired a nuclear weapons capability in the bipolar period, and they expanded these capabilities in the unipolar period. Meanwhile, the countries eschewed the nonproliferation regime while benefiting from the United States lifting nuclear-related sanctions following the September 2001 terrorist attacks on the United States. The latter provided another example of U.S. foreign policy prioritizing some security issues over nonproliferation concerns.

g. South Pacific

Nuclear proliferation decreased between 1991 and 2003. Australia had given up its nuclear weapons program in the bipolar period and no other country had sought to develop a nuclear weapons program since then. Australia continued to rely on U.S. extended deterrence commitments. During this period, moreover, the reach of the nonproliferation regime expanded in the South Pacific.

First, the region gained additional adherents to the South Pacific Nuclear-Free Zone treaty. The United States, the United Kingdom, and France had all conducted nuclear testing in the region beginning in 1946 with the United States. Michael Hamel-Green noted that, consequently, "regional concerns focused on radioactive fallout and

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[1518] Ibid., 251.

[1519] Ibid., 252.

[1520] Ibid.

associated legacies" from nuclear testing.[1521] France conducted its final nuclear weapons test in early 1996. Following this test, France and the United Kingdom signed and ratified the protocols of the region's NWFZ treaty, which applied the treaty to their territories and activities in the region.[1522] The United States signed, but did not ratify the protocols.[1523]

Second, spurred by Australia's history as a testing ground for nuclear weapons, Australia played an important role in the creation of the Comprehensive Test Ban Treaty. Australia helped move the treaty forward for signature and ratification.[1524] In 1996, the treaty was opened for signature. Also, in 1996, the Canberra Report, initiated by the Australian government, recommended that the NPT-sanctioned nuclear weapon states begin to take steps to get rid of their nuclear weapons.[1525]

These initiatives helped solidify the idea that the region stood in opposition to the development and use of nuclear weapons. Furthermore, they were regional endeavors, not created at the urging of the superpower. The region's history and identity was the key driver in the downward proliferation trend.

h. Southeast Asia

Nuclear proliferation decreased in Southeast Asia during this period. While no country in Southeast Asia had a nuclear weapons program, two regional trends occurred. First, regional states integrated themselves more fully into the nonproliferation regime by forming a NWFZ. Second, several states—Indonesia, Myanmar, and Vietnam—expressed an interest in developing nuclear energy capabilities, but not weapons.

[1521] Hamel-Green, "Cooperating Regionally, Denuclearizing Globally: Multilateral Nuclear-Weapon-Free-Zone Initiatives," 212.

[1522] "South Pacific Nuclear-Free Zone (SPNFZ) Treaty of Rarotonga."

[1523] Ibid.

[1524] "1996: CTBT: A Long-Sought Success," Comprehensive Test Ban Treaty Organization, accessed July 12, 2017, https://www.ctbto.org/the-treaty/1993-1996-treaty-negotiations/1996-ctbt-a-long-sought-success/.

[1525] A. F. Phillips, "Consensus in Canberra: No Nukes From Now On!," *Peace Magazine* 12, no. 6 (December 1996): 24.

As tensions between the superpowers decreased with the end of the Cold War, Southeast Asia was able to advance a NWFZ. Hamel-Green noted that "it was only after Russia and the United States withdrew from their respective military bases in Vietnam and the Philippines that ASEAN was able to proceed with a full-fledged NWFZ."[1526] A motivation for developing this zone was also related to Cold War superpower conflicts. Hamel-Green continued that forming this zone "was based on their concerns about potential nuclear conflicts involving NWS bases in the region, including Soviet use of Vietnamese ports at Cam Ranh Bay and Da Nang and U.S. bases in the Philippines."[1527] ASEAN members negotiated the treaty. In 1995, the treaty opened for signature and, in 1997, it entered into force. The nuclear weapon states did not sign this treaty, however, due to the restrictions it would place on the transit of nuclear weapons through the region, according to the Nuclear Threat Initiative.[1528]

In terms of membership in other nonproliferation agreements, the actions of key regional states were mixed. Indonesia signed the Comprehensive Test Ban Treaty in 1996, but did not ratify it at the time, and agreed to the Additional Protocol in 1999.[1529] Myanmar joined the NPT in 1992, the Comprehensive Safeguards Agreement in 1995, and the Small Quantities Protocol in 1995.[1530] The country signed the Comprehensive Test Ban Treaty in 1996, but did not ratify it at the time.[1531] Vietnam took the same approach to the Comprehensive Test Ban Treaty and signed it in 1996, but did not ratify it then.[1532]

Indonesia, Myanmar, and Vietnam began to examine the development of nuclear power in the mid-1990s. Indonesia conducted a feasibility study for nuclear power in

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[1526] Hamel-Green, "Cooperating Regionally, Denuclearizing Globally: Multilateral Nuclear-Weapon-Free-Zone Initiatives," 209.

[1527] Ibid., 216.

[1528] "Southeast Asian Nuclear-Weapon-Free-Zone (SEANWFZ) Treaty (Bangkok Treaty)."

[1529] "Profile for Indonesia."

[1530] "Profile for Myanmar."

[1531] Ibid.

[1532] "Profile for Vietnam."

1996 and began planning for a nuclear power reactor in 2001.[1533] Myanmar expressed an interest in nuclear power in 1995 and signed an agreement with Russia for a 10MW research reactor in 2001, but the deal later fell apart.[1534] Vietnam also began to express an interest in nuclear power in 1995, but the country did not make further progress on this project during the unipolar period.[1535] Thus, while several regional states indicated that they wished to acquire nuclear power capabilities, little progress was made.

Overall, the region's history motivated its move toward nonproliferation. The implementation of the NWFZ demonstrated that the region had made turning away from nuclear weapons a part of its identity.

i. Analysis

The unipolar period was characterized by the absence of superpower competition and generally decreased nuclear proliferation. The exceptions were Northeast Asia and, to some extent, South Asia. Limiting nuclear proliferation was a high priority for the sole superpower, although not in every region, given the conflict between nuclear nonproliferation and combatting terrorism in Afghanistan and South Asia after the September 11, 2001 terrorist attacks. In other areas, with the end of the Cold War, the United States had more resources – both economic and political – to pressure states regarding their proliferation activities. External management of regional nuclear proliferation was more effective. It involved tightening control over the nuclear supply chain and improving awareness of nuclear proliferation activities.

As part of this improved effectiveness, U.S.-led nonproliferation initiatives gained traction such as the Nuclear Suppliers Group and the Missile Technology Control Regime throughout the 1990s. Also, new initiatives were introduced such as Cooperative Threat Reduction, a U.S.-sponsored initiative focused on the states of the former Soviet Union,

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1533 "Nuclear Power in Indonesia."

1534 "Profile for Myanmar."

1535 "Nuclear Power in Vietnam," World Nuclear Association, March 2017, http://www.world-nuclear.org/information-library/country-profiles/countries-t-z/vietnam.aspx.

and the NPT Additional Protocol, established due to inspection challenges faced by the IAEA in Iraq and North Korea in the early 1990s.[1536]

As an external manager, the United States was aware of both the benefits and the shortcomings of the nonproliferation regime. In 1992, as Director of Central Intelligence, Robert Gates cited the importance of "international agreements and organizations like the Nuclear Proliferation Treaty, the Missile Technology Control Regime, the IAEA" but acknowledged their limitations.[1537] He noted "some countries will never find it in their interest to join. And membership is no guarantee of good behavior, because some countries only join to acquire trade, technology, and other benefits and have little intention of enforcing the regulations."[1538] Thus, political and economic tools, which the United States had at its disposal also played an important role in driving the decrease in nuclear proliferation.

Regions with histories of superpower competition in a nuclear context drove a downward proliferation trend in other regions. The NWFZ treaties could be seen as an effort to limit the nuclear activities of nuclear weapon states and turn away from a Cold War past. This occurred in several regions during the unipolar period to include Central Asia, Europe, the South Pacific, and Southeast Asia.

3. The Multipolar Period: 2004 to 2013

Looking at both intentions and capabilities, horizontal nuclear proliferation continued to decrease, or at a minimum did not increase in most world regions from 2004 to 2013. The exception was Northeast Asia due to North Korea's program. The United States sought to assure its allies in Northeast Asia that it would contain the North Korean threat. Only Iran remained as a major proliferation concern in the Middle East by the end

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1536 "Status of the Additional Protocol," International Atomic Energy Agency, June 11, 2015, https://www.iaea.org/safeguards/safeguards-legal-framework/additional-protocol/status-of-additional-protocol.

1537 *The Non-Proliferation of Weapons of Mass Destruction and Regulatory Improvement Act of 1992*, Hearings Before the Committee on Banking, Finance and Urban Affairs, House of Representatives, 102nd Congress, 18 (1992) (testimony of Robert M. Gates, Director, Central Intelligence Agency), https://www.loc.gov/law/find/nominations/gates/008_excerpt.pdf.

1538 Ibid.

of the period. Nuclear negotiations with Iran began in late 2013 that seemed to be undertaken in a serious manner by all parties. Signaling a permanent commitment to not acquire nuclear weapons, the NWFZ Treaty for Central Asia opened for signature in 2006 and the NWFZ treaties for Africa and Central Asia both entered into force in 2009.

a. Africa

In the multipolar period, nuclear proliferation decreased in Africa. Algeria and South Africa, the countries that previously had a suspicious nuclear program and an actual nuclear weapons program respectively, did not advance nuclear weapons capabilities. Libya, covered in the chapters on the Middle East, dismantled its nuclear weapons program. Importantly, the Treaty of Pelindaba entered into force in 2009. This endeavor was driven by a history of French nuclear testing and South Africa's previous program.[1539]

Algeria took steps to develop nuclear power. The country signed cooperation agreements with the United States, Russia, France, Argentina, and South Africa.[1540] Russia, in particular, worked with Algeria to develop plans for nuclear power.[1541] Algeria also created a Nuclear Engineering Institute to bolster national knowledge in the nuclear arena.[1542] As of 2013, Algeria hoped to have completed its first nuclear power plant by 2025.[1543] But, the country appeared to stay within the bounds it had agreed to in the unipolar period.

South Africa continued to develop nuclear-related industries, but it did not pursue nuclear weapons capabilities. It produced and exported nuclear materials and technologies and retained large stockpiles of highly enriched uranium, according to the

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[1539] Hamel-Green, "Cooperating Regionally, Denuclearizing Globally: Multilateral Nuclear-Weapon-Free-Zone Initiatives," 212.

[1540] "Profile for Algeria."

[1541] "Emerging Nuclear Energy Countries."

[1542] "Profile for Algeria."

[1543] "Emerging Nuclear Energy Countries."

Nuclear Threat Initiative.[1544] The country, however, moved toward using low enriched uranium in its reactors, rather than highly enriched uranium, beginning in 2008.[1545] South Africa also worked to expand its nuclear power capabilities. It signed a nuclear cooperation agreement with the United States in 2009 and advanced a nuclear partnership with Russia in 2013.[1546]

In terms of delivery systems, the country possessed short-range ballistic missiles, according to the Nuclear Threat Initiative.[1547] The report added that South Africa had the technical ability to develop a long-range ballistic missile, but it chose not to do so.[1548]

After moving away from nuclear proliferation in the bipolar period, Algeria and South Africa appeared to remain committed to this course. While regional conflict had diminished in southern Africa, North Africa had become turbulent due to the Arab Uprising. Nevertheless, neither state pursued a nuclear weapons capability. The Pelindaba Treaty's entry into force in 2009 underscored a regional commitment to nonproliferation as regional states forged a new identity and demonstrated decreased nuclear proliferation.

b. Central Asia

Nuclear proliferation decreased in Central Asia from 2004 to 2013. There was no indication that any of the region's states sought to acquire a nuclear weapons capability. Central Asia solidified its nuclear free intentions and identity by signing a NWFZ treaty.

After progress by the region's five states toward a NWFZ in the late 1990s and early 2000s, the Central Asian NWFZ treaty was signed by the region's states in 2006 and went into force in 2009.[1549] In a nod to the region's history with nuclear weapons testing, one of the requirements of the NWFZ was that all of its members comply with

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1544 "Profile for South Africa—Nuclear."

1545 Ibid.

1546 "Profile for South Africa—Nuclear"; "Emerging Nuclear Energy Countries."

1547 "Profile for South Africa—Missile."

1548 Ibid.

1549 "Central Asia Nuclear-Weapon-Free-Zone (CANWFZ)."

the Comprehensive Test Ban Treaty.[1550] It also required states to agree to comprehensive safeguards and the Additional Protocol.[1551]

Kazakhstan rid itself of all of its Cold War-era strategic nuclear weapons as part of Cooperative Threat Reduction during the previous period. From 2004 to 2013, it expanded its nuclear-related industry, but gave no indication that it sought to acquire nuclear weapons. Beginning in the early 2000s, Kazakhstan expanded its uranium production and became the top producer globally in 2009.[1552] It also signed various nuclear cooperation agreements in the mid- to late 2000s. These included agreements with Russia and China in 2006, with Canada and Japan in 2007, with France in 2008, with India in 2009, and with South Korea in 2010.[1553] The agreements with Russia and South Korea involved Kazakhstan's acquisition of nuclear power reactors.[1554] Plans were delayed, however, and construction had not begun on the power reactors by 2013.

In terms of delivery systems, Kazakhstan maintained short-range ballistic missiles that it inherited from the Soviet Union, according to the Nuclear Threat Initiative.[1555] The country launched a space program in 2007; however, it did not demonstrate any interest in missile proliferation.[1556]

The implementation of the NWFZ signaled regional intentions to continue moving away from nuclear proliferation. In reaction to the region's nuclear history, the states had come together to implement a NWFZ.

[1550] Ibid.

[1551] International Atomic Energy Agency, "Central Asia: Towards a Nuclear-Free World," September 8, 2006, https://www.iaea.org/newscenter/news/central-asia-towards-nuclear-free-world.

[1552] "Uranium and Nuclear Power in Kazakhstan," World Nuclear Association, June 2017, http://www.world-nuclear.org/information-library/country-profiles/countries-g-n/kazakhstan.aspx.

[1553] "Uranium and Nuclear Power in Kazakhstan"; "Profile for Kazakhstan—Nuclear."

[1554] "Uranium and Nuclear Power in Kazakhstan"; "Profile for Kazakhstan—Nuclear."

[1555] "Profile for Kazakhstan—Missile," Nuclear Threat Initiative, accessed July 17, 2017, http://www.nti.org/learn/countries/kazakhstan/delivery-systems/.

[1556] Ibid.

c. Europe

Nuclear proliferation continued to decrease in the multipolar period in Europe up to 2013. Ukraine and Belarus had relinquished nuclear weapons capabilities in the unipolar period. Efforts to encourage denuclearization in Ukraine continued from 2004 to 2013. In 2005, the country ratified the Additional Protocol. Working with the U.S. Department of Energy's National Nuclear Security Administration, the Ukraine switched the research reactor at the Kiev Institute for Nuclear Research to run on low enriched uranium from highly enriched uranium in 2008.[1557] In 2010, the Ukrainian government agreed to export all of its highly enriched uranium to Russia and this effort was completed in 2012.[1558]

Ukraine continued to rely on nuclear power to fulfill its energy needs. By 2005, Ukraine had 15 nuclear power reactors in operation with the operation of 11 of the reactors dating back to the 1980s.[1559] This included two new nuclear power reactors that became operational in 2005.[1560] Ukraine also maintained plans for 13 new power reactors as old ones were decommissioned.[1561] In addition, Ukraine was working to reduce its dependence on Russia for nuclear fuel and services.[1562] Thus, in 2005, the European Union and Ukraine signed a nuclear cooperation agreement to strengthen its energy ties with Europe.[1563]

In terms of Ukraine's delivery systems, the country possessed short-range ballistic missiles that remained from the time of the Cold War, according to the Nuclear Threat Initiative.[1564] There was still some cooperation between Russia and Ukraine in terms of

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[1557] "Ukraine Fuel Removal: Fact Sheet," National Nuclear Security Administration, March 26, 2012, https://nnsa.energy.gov/mediaroom/factsheets/ukraine.

[1558] Ibid.

[1559] "Nuclear Power in Ukraine."

[1560] Ibid.

[1561] Ibid.

[1562] Ibid.

[1563] Ibid.

[1564] "Profile for Ukraine—Missile," Nuclear Threat Initiative, accessed July 18, 2017, http://www.nti.org/learn/countries/ukraine/delivery-systems/.

missile production due to the facilities that remained in Ukraine from the Cold War.[1565] The report noted that Ukraine showed no effort, however, to produce long-range, solid-fuel missiles for military purposes even though the Yuzhmash plant continued to produce liquid-fueled rockets for satellite launch.[1566]

Belarus cooperated with Russia to improve its nuclear power capabilities. Belarus worked to build a nuclear power plant beginning in the mid-2000s.[1567] The plant would consist of two reactors and would be financed by Russia with Russia also handling fuel reprocessing.[1568] The construction of the first nuclear power reactor began in 2013.[1569] At the end of the period, however, these facilities were not operational. In terms of delivery systems, Belarus did not have the infrastructure to produce missiles, but it did cooperate with Russia to support its missile and space programs, according to the Nuclear Threat Initiative.[1570] It was not a member of the Missile Technology Control Regime.[1571]

Neither Ukraine nor Belarus made progress toward acquiring a nuclear weapons capability during the recent multipolar period. In fact, Ukraine continued to work to reduce its nuclear capabilities by removing all highly enriched uranium from the country in partnership with the United States and Russia.[1572] This downward trend continued to be driven by the region's Cold War history and its interest in forging a new identity.

d. Latin America

Nuclear weapons capabilities did not increase or decrease in Latin America during the multipolar period. Argentina started a space program. Argentina and Brazil

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[1565] Ibid.

[1566] Ibid.

[1567] "Profile for Belarus."

[1568] "Nuclear Power in Belarus," World Nuclear Association, March 2017, http://www.world-nuclear.org/information-library/country-profiles/countries-a-f/belarus.aspx.

[1569] Ibid.

[1570] "Profile for Belarus."

[1571] Ibid.

[1572] "Ukraine Fuel Removal."

developed their respective nuclear power industries and explored nuclear-powered submarine technology, however, there were no indications that either country would restart a nuclear weapons program.

Argentina advanced nuclear and missile technology in several areas during the multipolar period. The country further developed its nuclear power industry and began to provide power plant reactors and services.[1573] By the end of the period, the country had plans for three more nuclear reactors.[1574] Also, beginning in 2008, Argentina's research reactors operated only on low enriched uranium.[1575] In 2010, Argentina signed a nuclear cooperation agreement with Russia.[1576] That same year, Argentina announced that it would develop nuclear propulsion to power the Navy's ships and/or submarines, a technology that its neighbor Brazil had been working on for some time.[1577]

In terms of technology for delivery systems, in 2007, Argentina decided to begin developing a space program and pursue the ability to launch satellites.[1578] Nevertheless, it did not have ballistic missile capabilities, according to the Nuclear Threat Initiative.[1579]

Brazil continued to develop its nuclear power industry, albeit slowly, along with capabilities in other areas of nuclear technology, particularly nuclear submarines. In 2006, Brazil announced plans to build a third nuclear power plant, the Angra 3, and four additional nuclear power plants.[1580] Construction began on Angra 3 in 2010, but the project was plagued by delays related to corruption and financing.[1581] Nevertheless, the

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1573 "Profile for Argentina."

1574 "Nuclear Power in Argentina," World Nuclear Association, May 22, 2017, http://www.world-nuclear.org/information-library/country-profiles/countries-a-f/argentina.aspx.

1575 "Profile for Argentina."

1576 "Nuclear Power in Argentina."

1577 "Profile for Argentina."

1578 "Profile for Argentina—Missile."

1579 Ibid.

1580 "Nuclear Power in Brazil."

1581 Ibid.

country already possessed the capabilities to achieve a complete nuclear fuel cycle, according to the Nuclear Threat Initiative.[1582] In addition, Brazil was working to develop a nuclear submarine that would likely be fueled by low enriched uranium.[1583] Finally, Brazil dedicated significant resources to developing the Alcantara launch site and launchers for its space program, but did not make significant progress in this endeavor.[1584]

Otherwise, Argentina and Brazil continued to have a cooperative relationship on nuclear issues. For example, they collaborated on a project involving two research reactors in 2013.[1585] In the multipolar period, it did not appear that regional nuclear proliferation would increase in Latin America.

e. Northeast Asia

Nuclear proliferation increased in Northeast Asia from 2004 to 2013 as North Korea conducted multiple nuclear weapons tests. By the end of the period, the world had gained another nuclear weapon state that was not sanctioned by the NPT. Seemingly in response and despite extended deterrence commitments from the United States, Japan advanced its space program and South Korea and Taiwan sought to expand the range of their missiles. Based on the information examined here, there was no indication, however, that these neighbors of North Korea might pursue nuclear weapons.

While Japan did not possess ballistic missiles, it developed sophisticated missile defense capabilities beginning in the early 2000s and advanced its space program since the mid-2000s seemingly in response to North Korean missile threats, according to the Nuclear Threat Initiative.[1586] Moltz noted that Japan added a military component to its

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1582 "Profile for Brazil."

1583 Ibid.

1584 James Clay Moltz, "Brazil's Space Program: Dreaming with Its Feet on the Ground," *Space Policy* 33 (August 1, 2015): 15–16, https://doi.org/10.1016/j.spacepol.2015.05.001.

1585 "Nuclear Power in Brazil."

1586 "Profile for Japan—Missile."

space efforts in 2008.[1587] Finally, Japan retained full fuel cycle capabilities and an extensive and well-developed nuclear power program. Thus, Japan was viewed as possessing a latent nuclear capability.[1588]

Taiwan continued to develop its ballistic missile program, but did not seek to advance its nuclear weapons capability. Taiwan developed and tested the Yun Feng missile, a cruise missile with a range of 1200 km, according to the Nuclear Threat Initiative.[1589] The report added that Taiwian further developed variants of the Hsuing Feng cruise missile with a range of 600 km.[1590] As of late 2013, Taiwan continued its development efforts, but the Nuclear Threat Initiative noted that the country had not deployed a missile with a range greater than 1000 km.[1591] With the support of the United States, Taiwan also acquired missile defense systems, according to the Nuclear Threat Initiative.[1592] And Taiwan claimed to comply with Missile Technology Control Regime export guidelines.[1593] Nevertheless, Taiwan's efforts to increase the range of its missiles led to concerns regarding its future intentions. Taiwan expert Arthur Ding noted, "U.S. observers generally do not believe that Taiwan's conventional missiles alone can deter China, they believe that Taiwan might be creating a more promising nuclear option by first developing delivery systems commonly associated with nuclear weapons."[1594]

Nevertheless, Taiwan made little progress on developing its nuclear power industry. It worked to further construction on the two nuclear reactors that it had begun in 1999, as these reactors still had not become operational by the end of the period.[1595] In

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[1587] Moltz, *Asia's Space Race*, 43.

[1588] Furukawa, "Japan's Nuclear Option."

[1589] "Profile for Taiwan—Missile."

[1590] "Profile for Taiwan."

[1591] "Profile for Taiwan—Missile."

[1592] "Profile for Taiwan."

[1593] "Profile for Taiwan—Missile."

[1594] Ding, "Will Taiwan Go Nuclear?" 43.

[1595] "Nuclear Power in Taiwan."

addition, in 2009, Taiwan investigated the possibility of building six additional nuclear power reactors, but had not yet made significant progress on this plan.[1596]

South Korea improved its missile capabilities during this period, especially following North Korea's 2006 nuclear weapons test, and its nuclear power capabilities. While South Korea continued to urge North Korea to observe the 1992 Joint Declaration on the Denuclearization of the Korean Peninsula, it also advanced its missile program, according to the Nuclear Threat Initiative.[1597] The report further noted that, after 2011, South Korea sought to obtain missiles with a range of 800 to 1000 km and this effort was noted and addressed by the United States.[1598] Following negotiations, the United States agreed to a range of 800 km in 2012, according to the Nuclear Threat Initiative.[1599] The report concluded that, in 2012 and 2013, South Korea also worked to develop ship-to-land cruise and ballistic missiles, but it did not move beyond obtaining short-range ballistic missiles.[1600]

South Korea also developed its space program. South Korea sought to launch a satellite into orbit in 2009 and 2010, but was not successful.[1601] In 2013, South Korea finally launched a satellite into orbit using a liquid-fueled Angara booster first stage rocket obtained from Russia paired with a South Korean second stage and satellite. While this demonstrated South Korea was improving its missile launch capabilities, it still had not shown the ability to manufacture boosters like the Angara, and, thus, enable it to develop long-range ballistic missiles, according to Choe San-hun.[1602] Moltz assessed that South Korea began to advance the military applications for its space program in the mid-

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[1596] Ibid.

[1597] "Profile for South Korea."

[1598] Ibid.

[1599] Ibid.

[1600] "Profile for South Korea—Missile."

[1601] Ibid.

[1602] Choe Sang-hun, "On 3rd Try, South Korea Launches Satellite into Orbit," *New York Times*, January 30, 2013, http://www.nytimes.com/2013/01/31/world/asia/on-3d-try-south-korea-launches-satellite-into-orbit.html.

2000s, such as launching a satellite for military communications.[1603] South Korea's increasing missile capabilities have been a cause for concern given the potential for them to be used as a delivery system, if the country were able to acquire a full fuel cycle and a nuclear weapon design, according to the Nuclear Threat Initiative.[1604]

South Korea maintained a well-established nuclear power infrastructure and exported nuclear power technology through Korea Electric Power Company or KEPCO. During this period, five nuclear power reactors became operational and construction began on three more in South Korea.[1605] Despite South Korea's advanced nuclear fuel cycle capabilities, by the end of the period, the United States had not lifted the ban on reprocessing of spent fuel meaning that the country did not possess a complete nuclear fuel cycle, according to the Nuclear Threat Initiative.[1606] Rather, the United States expressed its continued commitment to South Korea's security.

However, nuclear proliferation continued to increase in North Korea throughout the period. All the while, North Korea was being pressured to halt its nuclear and missile activities. Two more rounds of Six-Party Talks occurred in 2004, with China taking a leading role, but the negotiations ground to a halt in 2005 and, according to the Nuclear Threat Initiative, North Korea extracted plutonium from its 5MW(e) reactor again.[1607] An initial agreement was reached in September 2005 after restarting the talks in July.[1608] In the agreement, North Korea said it would stop its nuclear program and consent to monitoring by the IAEA.[1609] The other side agreed to economic assistance and that steps would be taken to resolve the long-standing regional security conflicts with South Korea and Japan.[1610] The agreement did not move forward, however, as North Korea rejected

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[1603] Moltz, *Asia's Space Race*, 151.

[1604] "Profile for South Korea—Missile."

[1605] "Nuclear Power in South Korea."

[1606] "Profile for South Korea."

[1607] Ibid.

[1608] "Profile for North Korea."

[1609] "The Six Party Talks on North Korea's Nuclear Program."

[1610] Ibid.

the agreement once the United States froze North Korea's bank accounts based in third countries, according to the Council on Foreign Relations.[1611] Regional tensions remained high and, in October 2006, North Korea executed its first nuclear weapons test. Wade Huntley noted that China grew irritated with North Korea over this test, particularly given China's role in the Six-Party Talks.[1612]

Alternating progress in nuclear negotiations and nuclear weapons development continued. Nuclear negotiations with North Korea restarted in December 2006 and, by early 2007, the country consented to take steps that would halt its nuclear program and bring more transparency regarding its previous nuclear activities. In mid-2007, North Korea began dismantling its Yongbyon nuclear facility in exchange for sanctions relief promised in the talks.[1613] The Council on Foreign Relations noted that North Korea restarted its nuclear program, however, at the end of 2008 due to disagreements related to the monitoring of its program.[1614] The IAEA reported that it had not been able to conduct its safeguarding efforts in a complete manner since 1994.[1615] Further, the agency had been unable to carry out any safeguard measures from late 2002 through mid-2007 and between 2009 and 2013.[1616]

North Korea escalated its nuclear and missile testing in the late 2000s. In May 2009, the country tested another nuclear device. The U.S. intelligence community noted that the tests "strengthened our assessment that North Korea has produced nuclear weapons."[1617] North Korea revealed a uranium enrichment facility in November 2010.

[1611] Ibid.

[1612] Wade L. Huntley, "U.S. Policy toward North Korea in Strategic Context: Tempting Goliath's Fate," *Asian Survey* 47, no. 3 (2007): 477.

[1613] "The Six Party Talks on North Korea's Nuclear Program."

[1614] Ibid.

[1615] International Atomic Energy Agency, Board of Governors, Director General, "Application of Safeguards in the Democratic People's Republic of Korea," General Conference, August 28, 2013, 2, https://www.iaea.org/sites/default/files/gc57-22_en.pdf.

[1616] International Atomic Energy Agency, Board of Governors, Director General, 2.

[1617] Director of National Intelligence, "Unclassified Statement for the Record on the Worldwide Threat Assessment of the U.S. Intelligence Community for the Senate Select Committee on Intelligence, 2012," 6.

The U.S. intelligence community noted that the details in this revelation reinforced the idea that North Korea had been building up this capability for "an extended period of time."[1618] From 2011 to 2013, the United States and other members of the Six-Party Talks worked to convince North Korea to return to the negotiating table. Then, North Korea announced a third nuclear test on 12 February 2013.[1619] The IAEA reported that, in April 2013, North Korea stated that it would restart its nuclear efforts, including its uranium enrichment facility and the production reactor it had shut down in 2007.[1620]

North Korea's missile capabilities advanced to testing a purported intermediate-range ballistic missile, the Taepodong 2, in 2006, according to the Nuclear Threat Initiative.[1621] Norimitsu Onishi and David E. Sanger reported that the test failed after 42 seconds, however, while the rocket was in its first stage.[1622] North Korea placed a satellite into Low Earth Orbit with a Taepodong 2 space launch vehicle in December 2012. By late 2013, North Korea had publicly exhibited a mock-up of a road-mobile intercontinental ballistic missile on two different occasions. While missile experts questioned whether North Korea was capable of producing such a missile or ever would, at a minimum, it signaled the country's intentions.[1623] The U.S. intelligence community assessed that North Korea sought to acquire missiles capable of reaching the United States.[1624] The question remained how long it would take North Korea to achieve that goal if it did not halt its activities.

[1618] Director of National Intelligence, "Statement for the Record on the Worldwide Threat Assessment of the U.S. Intelligence Community for the Senate Select Committee on Intelligence, 2011," 6.

[1619] International Atomic Energy Agency, Board of Governors, Director General, "Application of Safeguards in the Democratic People's Republic of Korea," 2.

[1620] International Atomic Energy Agency, Board of Governors, Director General, 3.

[1621] "Profile for North Korea—Missile."

[1622] Norimitsu Onishi and David E. Sanger, "Missiles Fired by North Korea; Tests Protested," *New York Times*, July 5, 2006, http://www.nytimes.com/2006/07/05/world/asia/05missile.html.

[1623] Markus Schiller, Robert H. Schmucker, and J. James Kim, "Assessment of North Korea's Latest ICBM Mock-Up" (Asian Institute for Policy Studies, January 14, 2014), http://en.asaninst.org/contents/assessment-of-north-koreas-latest-icbm-mock-up/.

[1624] Director of National Intelligence, "Statement for the Record, Worldwide Threat Assessment of the U.S. Intelligence Community for the Senate Select Committee on Intelligence, 2014," 6.

During the multipolar period, China played a key role in advancing multilateral negotiations—the Six-Party Talks—to constrain North Korea. This initiative inched forward from 2003 to 2009. North Korea's indigenous nuclear and ballistic missile capabilities made monitoring and stopping North Korea's activities particularly difficult. North Korea continued its nuclear efforts through the end of 2013 by which time it had conducted three nuclear weapons tests and had made significant advances on a long-range ballistic missile. While multilateral efforts brought Iran to the negotiating table and resulted in serious nuclear negotiations by late 2013, the outcome was not the same for North Korea. Why was this?

North Korea and Iran were similar in several ways. Both North Korea and Iran had been driven by perceived regional security threats. They both viewed themselves in conflict with the United States. Also, North Korea and Iran's nuclear and ballistic missile programs had become largely indigenous.

The United States and other great powers found additional challenges in confronting North Korea. North Korea's status as an insular, economically disadvantaged, totalitarian state—unit level differences—compounded the counterproliferation challenge. U.S. economic and political tools for pressuring North Korea did not seem as effective as they had been with Iran. It appeared to have less leverage. In addition, North Korea's closed nature meant that it was hard to acquire information as to what was actually occurring. Also, as Moltz notes, this foreign policy challenge might have required more coordination with great powers China and Russia to more effectively pressure North Korea.[1625] That being said, China and Russia seemed less willing to cooperate on North Korea than Iran. Great power competition at the system level might help explain this.

In addition, by the multipolar period, based on the information examined in the section on the unipolar period, North Korea was already close to acquiring a nuclear weapon and its nuclear program was more advanced than Iran's program. Nuclear

[1625] Moltz, "U.S.-Russian Relations and the North Korean Crisis: A Role for the Russian Far East?," 735.

proliferation expert Wade Huntley noted that when "a country's nuclear weapons program approaches fruition, its capacity to begin wielding nuclear threats can erode the attractiveness of a negotiated settlement."[1626] On an international level, the dismal fact has been that no country has ever given up nuclear weapons unilaterally except for South Africa. And the high levels of conflict and rivalry persisting in Northeast Asia provided little hope that North Korea would agree to unilateral disarmament. These facts made the period of the 1990s, when North Korea's plutonium had been canned, appear in an even more favorable light.

In 2004, Jonathan Pollack and Mitchell Reiss noted that "Northeast Asia encompasses four of the world's six largest armies and (including the United States) three declared nuclear weapons states, as well as an undeclared nuclear power in North Korea."[1627] Furthermore, as Moltz notes, adding in the significant civilian nuclear power programs of Japan, South Korea, and Taiwan, the region primarily consists of nuclear weapon states and threshold states.[1628] These complex security dynamics continued to shape the nuclear proliferation trends in the region.

f. South Asia

Nuclear proliferation did not increase in South Asia from 2004 to 2013. In this period, concerns within the international community regarding nuclear proliferation in South Asia centered more on vertical proliferation. India and Pakistan continued to expand their nuclear weapons capabilities. By the end of the period, both countries likely possessed over 100 nuclear weapons each, according to the Arms Control Association.[1629]

[1626] Huntley, "Rebels without a Cause," 732.

[1627] Pollack and Reiss, "South Korea: The Tyranny of Geography and the Vexations of History," 254.

[1628] James Clay Moltz, "Future Nuclear Proliferation Scenarios in Northeast Asia," *Nonproliferation Review* 13, no. 3 (November 1, 2006): 591, https://doi.org/10.1080/10736700601071769.

[1629] "Nuclear Weapons: Who Has What at a Glance," Arms Control Association, July 2017, https://www.armscontrol.org/factsheets/Nuclearweaponswhohaswhat.

In addition to its nuclear weapons program, India expanded its nuclear power industry, relying on nuclear power to meet its energy needs.[1630] During this period, three nuclear power reactors became operational and one was nearing completion.[1631] India began construction on five more nuclear power reactors and laid plans for more.[1632]

India also worked to expand its missile capabilities as it developed a strategic triad as outlined by the Nuclear Threat Initiative. According to the report, India conducted the initial test of the submarine-launched ballistic missile, the Sagarika, in 2008.[1633] The report added that India tested the Shaurya solid-fueled missile several times after 2008.[1634] Furthermore, India successfully tested the Agni III in 2011 and tested the Agni V intercontinental ballistic missile, its first such missile, in 2012 and 2013.[1635] India announced it would develop the Agni VI intercontinental ballistic missile in 2012.[1636] It successfully tested the Dhanush sea-to-surface missile in 2013.[1637] In terms of India's space program, Moltz noted that the country created an aerospace command in 2008 in order to involve the Indian military in its space program.[1638] Overall, India significantly advanced its missile capabilities, demonstrating its sophisticated use of missile technology.

Finally, India sought to move away from its pariah status in regards to its nuclear weapons program. The country sought to integrate itself further into the nonproliferation regime, but in a way that would normalize its status as a nuclear weapon state. In July 2005, the United States took a key step that allowed India to begin normalizing its

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1630 "Nuclear Power in India," World Nuclear Association, June 30, 2017, http://www.world-nuclear.org/information-library/country-profiles/countries-g-n/india.aspx.

1631 Ibid.

1632 Ibid.

1633 "Profile for India," Nuclear Threat Initiative, accessed July 19, 2017, http://www.nti.org/learn/countries/india/.

1634 Ibid.

1635 Ibid.

1636 Ibid.

1637 "Profile for India—Missile."

1638 Moltz, *Asia's Space Race*, 127.

nuclear situation as President George W. Bush moved to end the U.S. suspension on nuclear trade with India.[1639] India and the United States signed an agreement for nuclear cooperation in 2008 and India was permitted to conduct trade with members of the Nuclear Suppliers Group.[1640] This opened the way for nuclear cooperation agreements with other states, including: Argentina, Canada, France, Mongolia, Kazakhstan, South Korea, Russia, and the United Kingdom.[1641] It entered into a tailored IAEA Safeguards Agreement in 2009.[1642] India, however, remained outside of the NPT and the Comprehensive Test Ban Treaty, but it sought membership in the international export control regimes.[1643] This normalization was perceived as an acceptance of India's nuclear program by some NPT non-nuclear weapon states and inequitable treatment for those who chose to forego nuclear weapons. Overall, India continued to advance its nuclear and missile capabilities.

Pakistan improved its nuclear power capabilities and ballistic missile capabilities during this period, while working to enhance its control over nuclear materials after the discovery of the A.Q. Khan network. In terms of the country's nuclear power industry, one nuclear power reactor became operational during this period and construction began on two more reactors, these latter two financed by China.[1644] Questions ensued regarding legality of the assistance by China since China had joined the Nuclear Suppliers Group in 2004 and its members were not to have nuclear dealings with Pakistan.[1645] The World Nuclear Association noted that China had "deepened cooperation [with Pakistan] since the international U.S.-led concessions to India in 2008."[1646] Otherwise, Pakistan brought

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1639 Jayshree Bajoria and Esther Pan, "Backgrounder: The U.S.-India Nuclear Deal," Council on Foreign Relations, November 5, 2010, http://www.cfr.org/india/us-india-nuclear-deal/p9663.

1640 "Profile for India—Nuclear."

1641 Ibid.

1642 Ibid.

1643 "Nuclear Power in India."

1644 "Nuclear Power in Pakistan," World Nuclear Association, July 2017, http://www.world-nuclear.org/information-library/country-profiles/countries-o-s/pakistan.aspx.

1645 Ibid.

1646 Ibid.

its nuclear power reactors and nuclear research reactors under tailored IAEA safeguards.[1647]

In terms of delivery systems, the country conducted a series of missile tests concurrently with India in the early to mid-2000s, as outlined by the Nuclear Threat Initiative.[1648] According to the report, they included tests of the Hatf-III and the Hatf-IV, short-range ballistic missiles, and the Hatf-V and the Hatf-VI, medium-range ballistic missiles.[1649] Then, in 2013, Pakistan tested two tactical ballistic missiles, the Hatf-II and the Hatf-IX.[1650] As of 2013, Pakistan possessed tactical missiles, short-range ballistic missiles, and medium-range ballistic missiles. In addition, Pakistan did not join the Missile Technology Control Regime, but continued with foreign missile sales, according to the Nuclear Threat Initiative.[1651]

Following the unraveling of the A.Q. Khan network in the 2003 to 2004 timeframe, Pakistan worked to better secure its nuclear materials. The Nuclear Threat Initiative noted that the country sought to more strictly enforce controls on nuclear and missile exports along the guidelines of the Nuclear Suppliers Group and the Missile Technology Control Regime.[1652] The report also noted that, beginning in the mid-2000s, the international community also raised concerns regarding the security of nuclear facilities from Taliban-affiliated groups.[1653]

During this period, India and Pakistan worked to create even more sophisticated nuclear and missile programs while seeking to normalize their programs in the eyes of the international community. What was notable was that they moved closer to adhering to several sets of nonproliferation regime guidelines, namely the Nuclear Suppliers Group and the Missile Technology Control Regime and both countries agreed to tailored IAEA

[1647] Ibid.

[1648] "Profile for Pakistan—Missile."

[1649] Ibid.

[1650] Ibid.

[1651] Ibid.

[1652] "Profile for Pakistan—Nuclear."

[1653] Ibid.

safeguards. This demonstrated the role that the nonproliferation regime played in establishing the guidelines for acceptable nuclear activities. Nevertheless, the nonproliferation regime did not constrain regional vertical proliferation.

g. South Pacific

Nuclear proliferation in the South Pacific region did not increase or decrease from 2004 to 2013. Australia, the one country that had pursued a nuclear weapons program in the past, did not seek to pursue nuclear weapons capabilities of any kind. Australia did not have any long-range ballistic missiles and did not seek to acquire them, according to the Nuclear Threat Initiative.[1654] The United States continued to provide security assurances to its ally.

The country did sign several nuclear cooperation agreements. In 2009, Australia signed an agreement with Indonesia, South Korea, and Vietnam.[1655] Australia and the United Arab Emirates signed an agreement for nuclear cooperation, ostensibly related to Australia's uranium supply, in 2012.[1656] Australia possessed almost one third of the world's uranium reserves.[1657] The country continued to provide uranium exports to NPT-sanctioned nuclear weapon states.[1658] Regional states remained integrated into the nonproliferation regime.

h. Southeast Asia

Nuclear proliferation did not increase or decrease in Southeast Asia in this period. Nevertheless, the international community monitored regional efforts to increase nuclear power capabilities or any sign of interest in nuclear weapons. Vietnam and Indonesia worked to develop their respective nuclear power industries, but, as of the end of the

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1654 "Profile for Australia."

1655 Ibid.

1656 Ibid.

1657 "Australia's Uranium," World Nuclear Association, July 2017, http://www.world-nuclear.org/information-library/country-profiles/countries-a-f/australia.aspx.

1658 "Profile for Australia."

period, neither country had begun construction on a nuclear power reactor.[1659] Allegations surfaced in 2010, however, that Myanmar was secretly pursuing a nuclear weapons program in collaboration with North Korea.[1660] Myanmar denied the report. Following intense scrutiny by the United States, Myanmar signed the IAEA's Additional Protocol in 2013. Overall, the regional states that signed the Southeast Asian NWFZ in the 1990s appeared to continue to pursue only peaceful uses of nuclear technology. Like the South Pacific, regional states remained integrated into the nonproliferation regime.

i. Analysis

The recent multipolar period was characterized by an increase in great power competition and either a decrease or no change in nuclear spread in most world regions. The exception was North Korea within Northeast Asia. Increased great power competition should have resulted in an increase in nuclear proliferation across the world's regions. The nonproliferation regime, however, helped facilitate cooperation among the great powers and delineate appropriate nuclear behavior in order to contain nuclear spread.

The nonproliferation regime also continued to expand. UN Security Council resolution 1540 was adopted in 2004 following the disruption of the A.Q. Khan network. It required members to combat the spread of weapons of mass destruction and means to deliver them, particularly to non-state actors.[1661] The Proliferation Security Initiative was initiated in 2003 following an incident in which, according to John Gittings, Suzanne Goldenberg, and Brian Whitaker, the U.S. Navy did not have the legal authority to disrupt an illicit December 2002 shipment of Scud missiles from North Korea to Yemen.[1662] It consisted of a series of bilateral initiatives between the United States and

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[1659] "Profile for Vietnam"; "Profile for Indonesia."

[1660] "Profile for Myanmar"; Joby Warrick, "Report Says Burma Is Taking Steps Toward Nuclear Weapons Program," *Washington Post*, June 4, 2010, http://www.washingtonpost.com/wp-dyn/content/article/2010/06/03/AR2010060304859.html.

[1661] U.S. Department of State, Bureau of International Security and Nonproliferation, "Fact Sheet: UNSCR 1540," U.S. Department of State, February 14, 2017, http://www.state.gov/t/isn/rls/fs/2017/266842.htm.

[1662] Gittings, Goldenberg, and Whitaker, "Sailing On, the Ship with a Hold Full of Scud Missiles."

other states willing to commit to interdiction against illicit transfers of weapons of mass destruction and their delivery systems.[1663]

The nonproliferation regime also continued to expand in the form of NWFZs. The Central Asian NWFZ treaty opened for signature in 2006 and went into force in 2009 and the African NWFZ treaty entered into force in 2009. Finally, Cooperative Threat Reduction continued in a number of the states that made up the former Soviet Union.

In terms of multilateral cooperation by great powers in this period, the EU-3, consisting of Germany, France, and the United Kingdom, initiated nuclear negotiations with Iran in the Middle East and China took a leading role in the Six-Party Talks with North Korea over its nuclear program. While each of these great powers undoubtedly had self-serving reasons for fulfilling these roles, these actions show a break from the past, particularly compared to China's and Germany's prior roles as suppliers of nuclear technology in the bipolar period, as discussed in previous sections.

While increasing competition by the great powers in the multipolar period might have led to less effective external management of regional nuclear proliferation, the nonproliferation regime facilitated great power cooperation in management endeavors in most regions. Bolstered by a strengthened nonproliferation regime, great powers beyond just the United States, took the initiative to manage nuclear issues.

D. CONCLUSION

My research on the Middle East showed, first, that increased competition at the systemic level in the bipolar period resulted in less effective external management of nuclear proliferation. Thus, regional nuclear proliferation increased. Second, my case studies showed that decreased competition at the systemic level in the unipolar period resulted in more effective external management of nuclear proliferation. Thus, regional nuclear proliferation in the Middle East decreased. Third, my findings indicated that despite increased competition at the systemic level in the recent multipolar period,

[1663] U.S. Department of State, Bureau of International Security and Nonproliferation, "Background: Proliferation Security Initiative."

external managers, aided by a strengthened nonproliferation regime that facilitated cooperation, continued to successfully manage regional nuclear proliferation and regional nuclear proliferation decreased.

In this chapter, I compared my findings on the Middle East with nuclear proliferation trends in the world's other regions—Africa, Central Asia, Europe, Latin America, Northeast Asia, South Asia, the South Pacific, and Southeast Asia. My findings on the Middle East helped explain nuclear proliferation trends in Africa, Latin America, and South Asia during the bipolar period. They also shed light on nuclear trends in Africa, Central Asia, Europe, and Latin America in the unipolar period.

This analysis chapter demonstrates three findings regarding the causes of proliferation. First, certain regions appear to be better explained by some theories than others. For example, external management was more effective in the bipolar period in both Northeast Asia and the South Pacific. In both of these regions, the United States was able to pressure allies into giving up their nuclear weapons programs and provide security assurances through extended deterrence. This behavior corresponds with what Kenneth Waltz might have predicted—superpowers managing the nuclear proliferation activities of client states and thus suppressing regional proliferation.

Second, external management has played perhaps the most important role in determining regional nuclear proliferation trends over time. But, external management does not explain why regional states might decide to pursue nuclear weapons. Examining levels of conflict and rivalry at the regional level can often provide a more satisfactory answer as to why a state might seek to increase nuclear capabilities. Whether that regional state continued to proliferate or not, however, often depended on the effectiveness of external management efforts. And, in these cases, the level of superpower competition either rendered external management more or less effective.

Third, the nonproliferation regime, broadly defined, has become increasingly important as a mechanism for helping to manage regional nuclear proliferation. The nonproliferation regime was strengthened by the United States and other actors, especially Western European countries, over time and helped drive a decrease in nuclear

proliferation in multiple world regions in the unipolar period. It continued to help facilitate cooperation and delineate appropriate nuclear behavior in the multipolar period. It would seem that the problems that plagued the effectiveness of superpower management in the bipolar period might also impede management effectiveness in the multipolar period. These were: lack of control over nuclear suppliers, less awareness of proliferation activities, less coordination by external managers, and regional foreign policy priorities that trumped nuclear proliferation concerns. A strengthened nonproliferation regime, however, seems to have helped maintain management effectiveness in several world regions. Nevertheless, NWFZs prove to be an exception, appearing to be driven by regional-level forces.

In the next chapter, the conclusion, I turn to a discussion of what these findings mean for future regional proliferation concerns, policy, and research. What are the implications for the role of external managers and the role of the nonproliferation regime in ensuring that nuclear proliferation does not increase in the future as great powers rise to meet the global hegemon in a multipolar international system?

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VI. CONCLUSION

Recent studies on the "second nuclear age" have suggested that the regional security environment has been the main driver of nuclear dynamics as the end of bipolarity weakened superpower constraints on regional states.[1664] Ashley Tellis writes that the end of the Soviet Union resulted in an erosion of "the tacit cooperation between the superpowers, which had helped constrain the rise of new nuclear weapon states" and "with the decay of these disciplining benefits of bipolarity, the number of countries acquiring or demonstrating nuclear capabilities slowly increased."[1665]

My research, by contrast, found that while the superpowers intended to limit nuclear proliferation during the Cold War, nuclear proliferation actually flourished from 1973 to 1990 driven by regional conflict and rivalry. Further, the intense competition between the superpowers in the international system, which was supposed to have constrained nuclear proliferation, instead fostered an environment conducive to increased nuclear proliferation due to a lack of control over nuclear suppliers, a lack of awareness of proliferation activities, a lack of cooperation by external managers, and certain foreign policy issues eclipsing nuclear proliferation concerns. Of the three periods I studied, my findings indicate that the bipolar period – contrary to mainstream arguments – was the most conducive to regional nuclear proliferation in the Middle East. This also appeared to be the case in Africa, Latin America, and South Asia. Between 1973 and 1990, India, Pakistan, and South Africa all acquired nuclear weapons. Iran, Iraq, Libya, and North Korea also advanced their nuclear weapons programs throughout this period. In addition, Saudi Arabia acquired intermediate-range ballistic missiles. Argentina and Brazil made significant progress in their nuclear programs before beginning a joint effort to end these programs. The nuclear rollback that did occur in Argentina, Brazil, and South Africa was self-initiated, not from superpower pressure.

[1664] Bracken, *The Second Nuclear Age*; Narang, *Nuclear Strategy in the Modern Era*; Alagappa, *The Long Shadow*; Tellis, Denmark, and Tanner, *Strategic Asia 2013–14*.

[1665] Tellis, Denmark, and Tanner, *Strategic Asia 2013–14*, 4.

There were success stories that reflected the traditional neo-realist narrative regarding Cold War-era regional nuclear proliferation. Nuclear proliferation appeared to decrease due to superpower management in Northeast Asia and the South Pacific. Nuclear weapons programs were brought to an end in Australia, Egypt, South Korea, and Taiwan due to superpower efforts, or as it is referred to in this dissertation, external management. All of these states had clear security reasons to seek nuclear weapons, but superpower influence, primarily U.S. influence, appeared to be the cause of the end of their programs. Australia, South Korea, and Taiwan were all U.S. allies and Egypt became one following the 1973 Arab-Israeli conflict. These cases, however, are in the minority. Several other states chose to renounce their nuclear weapons programs—Argentina, Brazil, and South Africa—but it seems that they themselves initiated this process. It did not appear to be due to the effects of constraints imposed by the superpowers, contrary to mainstream arguments.

Despite the predictions of structural theorists, global nuclear nonproliferation efforts appeared to benefit from the end of the Cold War. Within the Middle East, the trend was toward a decrease in nuclear proliferation. In many world regions, the trend also seemed to deemphasize nuclear weapons. The exceptions were Northeast Asia and South Asia. The number of regional states pursuing nuclear weapons slowly decreased. From 1991 to 2003, multiple states either ended nuclear weapons programs (in the case of Iraq, forcibly) or reduced their nuclear weapons capabilities. The nuclear weapons programs in Iraq and Libya came to an end. Argentina, Brazil, and South Africa ended their ballistic missile programs. Algeria reined in its suspicious nuclear efforts. Belarus, Kazakhstan, and the Ukraine voluntarily gave up the nuclear weapons capabilities they had inherited from the Soviet Union. Regions formed and implemented nuclear-weapon-free zones (NWFZs). By the end of 2003, it was primarily Iran and North Korea that remained of high concern to the international community as potential proliferators. This was a clear decrease from 1991. The United States as the sole superpower had taken on the cause of denuclearization as one of its top priorities following the end of the Cold War and global nonproliferation was the winner. As the global hegemon, it was the architect and driving force behind these endeavors.

What does the role of external management mean for realist outlooks at both the system level and the regional level? Nuclear proliferation challenges at the regional level have been handled by the superpowers or great powers due to the distribution of capabilities among the units in the international system. They have the capacity to intervene and manage proliferation issues because of these capabilities. Waltz notes that these management tasks fall to the great powers as they are "agents of great capability."[1666] In addition, regional nuclear proliferation has been viewed as not just a regional threat, but also as a global threat. Thus, managing these threats mitigates security concerns for the great powers as well. But a unique feature of managing proliferation in the new multipolar era has been the willingness of great powers (thus far) to assist in nonproliferation efforts across Cold War "bloc" lines. That is, states have been willing to support international nonproliferation norms (born in the bipolar era) even against their narrow self-interested relations with certain proliferators today.

In addition to the overall decrease in potential proliferators, a strengthened nonproliferation regime provided evidence of U.S. efforts. Jeffrey Knopf writes that "many of the global [nonproliferation] efforts resulted from a U.S. initiative, and it is hard to imagine them coming into being in the absence of U.S. leadership."[1667] During the bipolar period, the United States recognized the weaknesses of the Nuclear Nonproliferation Treaty (NPT) as regional nuclear proliferation bloomed. It began to try and fill some of the perceived gaps and loopholes by initiating the establishment of the Nuclear Suppliers Group and the Missile Technology Control Regime. In the unipolar period, the United States instigated Cooperative Threat Reduction, the Wassenaar Arrangement, United Nations Security Council 1540, and the Proliferation Security Initiative. It also supported the establishment of the Additional Protocol among other bilateral and multilateral initiatives. Underscoring the critical role of U.S. leadership, Knopf found in his recent edited volume, *International Cooperation on WMD*

[1666] Waltz, *Theory of International Politics*, 109.

[1667] Jeffrey W. Knopf, "Conclusions," in *International Cooperation on WMD Nonproliferation*, ed. Jeffrey W. Knopf (Athens, GA: University of Georgia Press, 2016), 300.

Nonproliferation, that the factors that best explained this cooperation were a combination of state self-interest and U.S. leadership.[1668]

In a multipolar setting, nuclear proliferation decreased in the Middle East. In other world regions, the nuclear proliferation trend appeared to be similar. The exception was Northeast Asia. And, the especially hard cases—Iran and North Korea—remained. Both countries had advanced nuclear weapons programs. External management by the United States during the unipolar period had come close to reining in both programs, but the global hegemon had not been completely successful in either case. The United States would also discover that North Korea had begun aiding Syria, an ally of Iran, to establish a possible nuclear weapons program. In this time, other great powers began to function more as external managers. Three European states—Germany, France, and the United Kingdom—initiated nuclear negotiations with Iran. China took a leading role in negotiations with North Korea. This would have been unthinkable in the bipolar period when the United States was occupied with trying to block countries like West Germany and China from providing nuclear technology to various regional states. This was because U.S. efforts to stem proliferation, particularly in the unipolar period, helped define what was acceptable and unacceptable nuclear behavior. Outliers, such as Iran and North Korea, were marginalized and punished. Countries that eventually complied with accepted proliferation guidelines, as Libya did, were praised. With the nonproliferation regime more strongly established in the multipolar period, other states took a leadership role in enforcing these established guidelines.

The findings of this dissertation, however, may provide a cautionary warning. What happens if the nuclear nonproliferation regime, which has helped to facilitate great power cooperation and to control the spread of nuclear weapons and associated technology nuclear spread, becomes weaker? What if its capacity to influence nuclear proliferation-related activities erodes? What happens if this occurs during a time of intense competition in the international system, an environment that is seemingly more conducive to nuclear spread? Would external managers once again face a lack of control

[1668] Knopf, 299–300.

over the nuclear supply chain, a lack of awareness of regional proliferation activities, a lack of coordination or cooperation by external managers, and an increase in regional foreign policy issues that might take priority over nuclear proliferation concerns? Or would the management mechanisms for controlling nuclear proliferation hold?

Thus, what are the implications of this dissertation's findings in regards to external management and the role of the nonproliferation regime in the future? In particular, what does this mean for U.S. policy, given the country's long history of working to control nuclear spread? What other avenues of research might help further our understanding of regional nuclear proliferation? The rest of this chapter is dedicated to answering these questions.

A. FUTURE REGIONAL PROLIFERATION CHALLENGES

If heightened competition in the international system resulted in increased nuclear proliferation in the past, policymakers cannot take the current state of decreased proliferation for granted. Decreased regional nuclear proliferation seemed to be driven by the advantages enjoyed by the United States as the global hegemon. While other NPT members have not always agreed with the U.S. approach to combatting nuclear proliferation, it has been the state that tackled the issue of proliferation most aggressively using the full range of options available to a superpower. Without U.S. efforts, it is likely that there would have been more nuclear powers than there are today.

Nevertheless, there would seem to be a real danger that increased competition in a multipolar setting may result in less effective external management. The same factors that caused increased nuclear proliferation under bipolarity may also characterize multipolarity. The nuclear nonproliferation regime may become weaker without the driving force of U.S. hegemony. Powers such as Russia and China historically have had a less stringent view on nuclear proliferation activities than the United States. For example, Russia and China have seemed more willing to accept North Korea as a nuclear weapons state. Thus, the nonproliferation regime helps facilitate cooperation around the issue of nuclear proliferation, making it more than the sum of its parts. But it would not stand on its own without the voluntary support of the great powers.

This suggests two approaches that may provide the best path for limiting nuclear spread. The first approach is strengthening nonproliferation cooperation among the great powers and the second approach is continuing to improve the nonproliferation regime by closing gaps or loopholes that become apparent over time. Admittedly, there is overlap between them as the nonproliferation regime has provided a forum for great power cooperation. If such measures are not taken, there would seem to be increased danger that those countries that find themselves in the crosshairs of great power competition, such as India and Pakistan, might regain the operational space to pursue nuclear weapons. Likely candidates for increased nuclear proliferation might be those states that have chafed under U.S. hegemony, are less integrated into the nonproliferation regime or face a threatening regional security environment.

Considering the four factors previously discussed that contributed to increasing regional proliferation in the bipolar period, improving external management would involve: 1) improved mechanisms for controlling the nuclear supply chain; 2) focused effort by external managers to cooperate to limit nuclear proliferation; 3) continued close vigilance of nuclear proliferation activities; and 4) a consensus among great powers as to when a country's drive to acquire nuclear weapons has reached a threshold where addressing the proliferation issue should take precedence over other policy concerns. The nonproliferation regime has proved to be a mechanism to help with these tasks. How might external managers aided by the nonproliferation regime confront nascent challenges posed by Iran and North Korea?

1. The Middle East

In the Middle East, the most pressing issue is the implementation of the Iranian nuclear agreement, the Joint Comprehensive Plan of Action. Some proliferation experts such as David Albright remain skeptical of the effectiveness of the agreement for curbing Iranian nuclear weapons proliferation, while other experts such as Paul Kerr are

optimistic about the plan's prospects.[1669] If past proves to be prologue, Iran's nuclear intentions and actions will need to remain under close scrutiny for the foreseeable future. The effectiveness of the agreement will depend on how it is implemented and enforced. Great power cooperation and the nonproliferation regime have important roles to play.

In addition to increasing Iran's breakout time for nuclear weapons, the Joint Comprehensive Plan of Action allows for greater insight into Iran's nuclear activities through International Atomic Energy Agency (IAEA) monitoring and provides the guidelines for Iran's nuclear behavior as agreed to by the great powers. The U.S. intelligence community noted in May 2017 that the agreement "enhanced the transparency of Iran's nuclear activities, mainly through improved access by the IAEA and its investigative authorities under the Additional Protocol to its Comprehensive Safeguards Agreement."[1670] The negotiation process and the eventual agreement ensured that great power managers remained focused on this proliferation issue, that Iran's program would be closely scrutinized, and that there was a level of consensus regarding great power expectations for Iran's nuclear behavior. In addition, the IAEA and the Additional Protocol, critical elements of the nonproliferation regime, play an important role in the agreement's enforcement. External managers and the nonproliferation regime appear to be constraining Iran's nuclear aspirations.

Second, what is the possibility for a NWFZ in the Middle East? The controversy surrounding Israel's alleged nuclear weapons program makes it difficult to imagine a region-wide NWFZ. Thinking along the lines of T.V. Paul's assertion regarding economic integration and regional denuclearization, might a sub-region of the Middle

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[1669] Please see *Assessing the Iran Deal: Examining Iranian Non-Compliance with the Joint Comprehensive Plan of Action and the United Nations Security Council Resolution 2231*, Before the House Sub-Committee on National Security, Committee on Oversight and Government Reform, 115th Congress (April 5, 2017) (testimony of David Albright, President, Institute for Science and International Security), https://oversight.house.gov/wp-content/uploads/2017/04/Albright-Statement-Iran-Violations-4-5.pdf and Paul Kerr, "The Enduring Value of Annex I (T) Restrictions Under the Joint Comprehensive Plan of Action," *Arms Control Wonk*, April 7, 2017, http://www.armscontrolwonk.com/archive/1203033/kerr-on-the-jcpoa/.

[1670] Director of National Intelligence, "Statement for the Record, Worldwide Threat Assessment of the U.S. Intelligence Community for the Senate Select Committee on Intelligence, 2017," May 11, 2017, 7, https://www.dni.gov/files/documents/Newsroom/Testimonies/SSCI%20Unclassified%20SFR%20-%20Final.pdf.

East that is more peaceful, prosperous, and stable form a NWFZ? The Gulf States makeup a sub-region that traditionally has been more integrated than the rest of this geographic area—politically, economically, and militarily. The Gulf Cooperation Council provides the organizational structure for their joint efforts. One might see a parallel here between the Gulf Cooperation Council and the Association of Southeast Asian Nations whose members signed the Treaty of Bangkok. If the Gulf Cooperation Council were to expand in the future, such as with the proposed additions of Morocco and Jordan, perhaps the NWFZ could expand as well.

In terms of nuclear advances already underway in this sub-region, the United Arab Emirates is the only Gulf state that has begun construction of a nuclear power plant. The first of four nuclear reactors is due to be completed in 2017 in the emirate of Abu Dhabi. In addition, the emirate of Dubai has led the way on the country's satellite programs. The United Arab Emirates launched its own satellite, *DubaiSat-1*, into space in 2009.[1671] In 2015, the emirate of Dubai also announced plans for a space program with a goal of a mission to Mars.[1672] Given the 123 nuclear agreement with the United States in place for the United Arab Emirates' nuclear power program, however, there is less concern over the country's space program than Iran's space program in terms of its possible diversion for the purposes of nuclear weapons delivery.

This sub-region has also served as a counterweight to Iran. Saudi Arabia, the United Arab Emirates, and the other Gulf states remain as likely partners for the United States. In many ways, their success today is due to U.S. support. The United States saved Kuwait from Iraq's aggression in 1991 and then removed the Iraqi threat in 2003. Iraq's invasion of Kuwait prompted the Gulf States to spend billions of dollars on defense technology, with the United States serving as a primary supplier. The combination of an upward trend in the growth of the Gulf economies and their purchase of defense equipment has helped make Saudi Arabia and the United Arab Emirates regional

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[1671] "UAE Space Programme: All You Need to Know," *The National*, December 20, 2015, http://www.thenational.ae/business/economy/uae-space-programme-all-you-need-to-know.

[1672] "To Boldly Go Where No Arab Has Gone Before," *Madarat: The Official Magazine of UAE Space Agency*, November 2015, 8–11.

powerhouses. This development trajectory of the sub-region may also provide an incentive for the states to form a NWFZ. The fact that the United Arab Emirates has quietly allowed Israeli officials to visit the country as part of their work with the Abu-Dhabi based International Renewable Energy Agency may signal some openness to a gradual shift in the region's long-standing security dynamic. With the perception of a reduced regional threat, the Gulf States may see the establishment of an NWFZ as the crowning achievement of a wealthy and prosperous sub-region within the Middle East. Nevertheless, the recent July 2017 passage of the Treaty on the Prohibition of Nuclear Weapons may relieve pressure on regional states to form a NWFZ. Regional states like Iran and Saudi Arabia that signed the agreement may claim that they have already committed to a nuclear-free environment and that a regional NWFZ is not necessary.

2. Northeast Asia

Northeast Asia seemed to remain the regional outlier throughout the three periods studied here. The region experienced a denuclearization trend during the bipolar period and it did not respond to vigorous external management efforts to affect a continued decrease in nuclear proliferation during the unipolar and multipolar periods. In fact, this region seemed to align more closely with a traditional neorealist view of proliferation trends in the Cold War era in which the superpowers managed client states and constrained nuclear proliferation efforts. Throughout the three time periods, the United States provided extended deterrence to its regional allies.

There appear to be two lines of thinking in policy circles when it comes to the current North Korea nuclear crisis. The first one is that a North Korean nuclear weapons program can never be legitimized in any way and the country must rollback its program. North Korea's history of exporting its missile, and likely nuclear technology in the case of Syria, discussed in the previous chapter, makes normalizing North Korea's nuclear status in any way seem very risky. North Korea has contributed to significant missile proliferation in third countries and, if it were to build up a greater nuclear arsenal, it would not be hard to imagine a scenario where North Korea exported technology or material related to building a nuclear weapons program. Given the country's

impoverished state, it certainly has the financial motivation to do so. In this sense, North Korea seems to pose two threats. The first one is the security risk posed by the existence of another nuclear weapons state. And there seems to be a growing consensus among external managers, even China, that North Korea poses a significant threat to regional stability.[1673] The second concern is a possible threat to the denuclearization effort worldwide.[1674] North Korea has proven to be a nuclear supplier difficult to constrain.

The second way of thinking is that North Korea's nuclear weapons capabilities are now a matter of fact and any policy formulated to address the North Korean crisis must acknowledge this. Looking back at the history of nuclear proliferation, once a country has acquired an indigenous nuclear weapons program and remains steeped in a high-threat regional security environment, it has only on one occasion (South Africa) given the program up. And North Korea's nuclear program is of great value to the regime. In fact, the regime may perceive a link between its survival and the nuclear weapons program. The history of other "rogue" states with nuclear weapons programs, Libya and Iraq, may reinforce this idea. U.S. intelligence noted in May 2017 that "we have long assessed that Pyongyang's nuclear capabilities are intended for deterrence, international prestige, and coercive diplomacy."[1675]

Regardless of the eventual nonproliferation goals for North Korea, the first requirement is to gain leverage to pressure North Korea to stop advancing its nuclear weapons capabilities and there does not seem to be a way to advance this goal without involving Russia and China. External managers working together to pressure Iran resulted in the country coming to the negotiating table in 2013. The United States helped lead the way on the Iranian negotiations by implementing punishing economic sanctions. When those sanctions were also embraced by China and Russia, Iran began to be more open to negotiations. Economic sanctions, especially secondary sanctions, pushed Iran to

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[1673] Celia Hatton, "Is China Ready to Abandon North Korea?" *BBC News*, April 12, 2013, http://www.bbc.com/news/world-asia-china-22062589.

[1674] Wade L. Huntley, "The Korean Conundrum: A Regional Answer to the Nuclear Crisis," *Global Dialogue* 8, no. 1 (2006): 95.

[1675] Director of National Intelligence, "Statement for the Record, Worldwide Threat Assessment of the U.S. Intelligence Community for the Senate Select Committee on Intelligence, 2017," 7.

the point where Iran judged it was in its greater interest to negotiate rather than continue pursuing its nuclear program. What are the equivalent levers to pressure North Korea and what role should external managers and the nonproliferation regime play?

Fortunately, there seems to be a convergence between strategies to begin to address the crisis. In a multipolar setting, if more traditional neo-realist explanations help explain nuclear trends in Northeast Asia, North Korea should respond best to pressure from Russia and China, given their past and current patron-client relationships. If an explanation based on the role of external management and nonproliferation help elucidate nuclear trends in the region, North Korea may respond to a multilateral approach that makes use of the mechanisms established in the nonproliferation regime. Either way, China and Russia should play a central role in addressing this crisis. Regional experts have advocated a multilateral approach since at least the early to mid-2000s.[1676]

In the former approach, China and Russia should be responsible for reining in North Korea. In the latter approach, cooperation among the great powers, especially the United States, Russia, and China would be critical for negotiating a settlement along with North Korea's re-integration into the nonproliferation regime. External managers can improve control over nuclear supply issues, better monitor North Korea's nuclear activities, and improve cooperation among the great powers as there would seem to be no lasting solution to this problem without the involvement of China and Russia. The eventual outcome of the North Korean nuclear crisis and the path taken to reach that result will signal how nuclear proliferation will be managed in a multipolar setting.

3. Nuclear Power

Renewed interest in nuclear power sparked concern that this interest represented a form of nuclear hedging. So far, however, nuclear power announcements have been slow to translate into concrete results. In the Middle East, construction on only one nuclear power plant has begun, and it is in the wealthy United Arab Emirates. Several Gulf States

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[1676] For example, see James Clay Moltz and C. Kenneth Quinones, "Getting Serious about a Multilateral Approach to North Korea," *Nonproliferation Review* 11, no. 1 (March 1, 2004): 136–44, doi:10.1080/10736700408436960; and Huntley, "The Korean Conundrum: A Regional Answer to the Nuclear Crisis."

opted not to pursue nuclear power after the Fukushima nuclear disaster. Of the eleven countries that expressed interest in nuclear power in the mid-2000s, five countries either decided against pursuing nuclear power or made no significant progress toward reaching that goal. Bahrain, Oman, and Qatar opted against developing nuclear power. Syria and Yemen have suffered from civil strife. Egypt, Jordan, Saudi Arabia, Turkey, and the United Arab Emirates continued to advance nuclear power plans. The United Arab Emirates planned to have its first power reactor, which was being built by South Korea, completed during 2017. As of August 2017, however, no construction had begun on nuclear power plants in Egypt, Jordan, Saudi Arabia, or Turkey. Nevertheless, all four countries were working toward that eventual goal. If nuclear power plans were to advance, it would be in the interest of the United States and other great powers to negotiate the equivalent of the United Arab Emirates' "gold standard" 123 nuclear agreement.

On a global scale, nuclear power projects seem to cost more to complete and take longer to finish than planned.[1677] State commitment to financing nuclear power, either by the state itself or a sponsoring state, has seemed to be necessary. Even with state financing, the future of nuclear power remains unclear. Russia appears to be active as a nuclear power supplier in the Middle East region and has signed a number of nuclear cooperation agreements in the 2000s. Nuclear supplier agreements, however, have a long history of falling through or not being completed. For example, in November 2015, Egypt signed an agreement with Russia for four nuclear power reactors.[1678] Russia committed to finance and build the reactors.[1679] But there has been little sign of forward momentum on this project. As Henry Sokolski notes it is "market economics, more than any other force, that has kept most states from starting or completing these programs."[1680]

[1677] Henry D. Sokolski, "Nuclear Power, Energy Markets, and Proliferation," in *Nuclear Power's Global Expansion: Weighing Its Costs and Risks*, ed. Henry D. Sokolski (U.S. Army War College Strategic Studies Institute, 2010), http://www.npolicy.org/books/Global_Expansion/Full_Book.pdf.

[1678] "A Nuclear Nile," *Foreign Affairs*, December 9, 2015, https://www.foreignaffairs.com/articles/egypt/2015-12-08/nuclear-nile.

[1679] Ibid.

[1680] Sokolski, "Nuclear Power, Energy Markets, and Proliferation," 3.

Incidents like Westinghouse's March 2017 bankruptcy do little to alleviate these concerns.[1681]

B. POLICY IMPLICATIONS

In terms of policy implications, the findings from this dissertation indicate that policymakers seeking ways to continue to limit nuclear spread should focus on encouraging international cooperation between the great powers on nuclear proliferation, despite the transition to a multipolar system, and finding ways to strengthen the nonproliferation regime. James Russell also highlights the importance of "outside powers" in managing nuclear proliferation issues.[1682] Nuclear spread was constrained in the Middle East and seemingly in other world regions due to vigorous external management efforts by the superpowers, particularly the United States. Dedicated effort to this cause at multiple levels of the U.S. government contributed significantly to the current trend of decreased nuclear proliferation. U.S. security interests are best served by continued pursuit of controlling nuclear spread and participation in the nonproliferation regime.

Despite the U.S. tendency to go it alone in finding solutions to nuclear proliferation challenges in the past, in a multipolar setting, it may best serve the overarching goal of constraining nuclear proliferation for the United States to more often support a multilateral process. The nonproliferation regime in its current form is not without imperfections and it can still be improved upon. Nevertheless, it has been a critical tool in bringing states together to address nuclear proliferation challenges. The United States has been a leader in creating bilateral and multilateral mechanisms to manage nuclear proliferation challenges. This expertise will be required if the nonproliferation regime is to continue to effectively address future nuclear proliferation challenges.

1681 Patrick Reilly, "Why Is Westinghouse Declaring Bankruptcy?" *Christian Science Monitor*, March 29, 2017, https://www.csmonitor.com/Business/2017/0329/Why-is-Westinghouse-declaring-bankruptcy.

1682 James A. Russell, "A Tipping Point Realized? Nuclear Proliferation in the Persian Gulf and Middle East," *Contemporary Security Policy* 29, no. 3 (December 1, 2008): 534, https://doi.org/10.1080/13523260802514860.

In a multipolar system, cooperating with great powers in this endeavor will be necessary. External managers should rely on traditional tools of statecraft such as economic sanctions, political pressure, and diplomatic negotiations utilized in coordination with other great powers for maximum effectiveness. The United States, Russia, China, and leading states in Europe—Germany, France, and the United Kingdom—should cooperate in the arena of nuclear nonproliferation even if competition is occurring in other areas.

In a multipolar setting, external management may prove to be more difficult as great powers rise to meet the hegemon resulting in increased competition in the international system. As in the bipolar period, this competition has the potential to create an environment more conducive to nuclear spread. The advantage that external managers have in the multipolar setting is that the nonproliferation regime has evolved into a more sophisticated tool for managing nuclear proliferation. It provides a forum to address nuclear proliferation issues along with guidelines as to acceptable nuclear behavior. Great power support for the nonproliferation regime will ensure that the usefulness of this management tool will not fade over time.

C. FUTURE RESEARCH OPPORTUNITIES

The findings of this dissertation point to four avenues for possible future research. First, applying my framework to other world regions in the analysis chapter appeared to produce results similar to my dissertation. Nevertheless, one cannot thoroughly cover in a matter of pages what has been investigated at length in three dissertation chapters. Thus, it would be useful to conduct studies on the rest of the world's regions that parallel this dissertation on the Middle East. Are there factors that it might have missed in each regional overview? Applying my framework in an in-depth manner to a different region would contribute to the understanding of regional nuclear proliferation.

This study also has highlighted the unique security environment in Northeast Asia. My review of regional nuclear trends suggested that nuclear proliferation decreased during the bipolar period in Northeast Asia, but did not decrease in successive periods despite vigorous efforts by external managers. Northeast Asia was the only region that

seemed to follow this proliferation trend. What insights might be gained by examining the roles of the regional security environment and external management in driving nuclear proliferation trends in Northeast Asia? What made the difference in this region? Was it the relatively permissive role of China? Was there another security dynamic at play at either the system level or regional level? As some theories seem to explain nuclear behavior in one region better than another, perhaps a distinct theory would shed light on Northeast Asian nuclear dynamics.

Another topic for possible further research is the role of external management and the nonproliferation regime in managing vertical proliferation. My research focused on nuclear spread rather than on vertical proliferation. External managers seem to have been less successful in limiting vertical proliferation. Outside of the United States and Russia, which have reduced nuclear weapons stockpiles through bilateral agreements, the global proliferation trend seems to be toward an increase in stockpiles of nuclear weapons, fissile materials, and nuclear weapons capabilities. The remaining nuclear weapon states—whether NPT-sanctioned or not—continue to see great value in nuclear weapons, especially for deterrence.[1683] Such a study might investigate what factors seem to drive vertical proliferation and what role external managers might play in these proliferation trends.

Finally, one could take a similar approach to this study—examining regional nuclear proliferation over a series of decades—but investigate a state-level theory. Perhaps this could involve examining the idea of national identity, building on the work done by Jacque Hymans, Peter Lavoy, and Jack Snyder, referenced in the introductory chapter. It might ask if national identity contributes to regional identity and what affect a possible regional identity might have on nuclear proliferation trends. This might be particularly helpful in explaining nuclear behavior in the regions that have embraced nuclear-weapon-free zones.

[1683] Muthiah Alagappa, "Reinforcing National Security and Regional Stability: The Implications of Nuclear Weapons and Strategies," in *The Long Shadow: Nuclear Weapons and Security in 21st Century Asia*, ed. Muthiah Alagappa, First Edition (Palo Alto, CA: Stanford University Press, 2008), 539.

D. CONCLUSION

This dissertation's findings are different than what I had envisioned they would be as I drafted the proposal. When I started out, I thought I would likely be writing a dissertation about how regional conflict and rivalry drove nuclear proliferation trends over time. Instead, in researching the drivers for Middle East nuclear trends, I found evidence that external management efforts rather than increasing or decreasing levels of conflict and rivalry drove these trends. Regional states faced real security challenges and viewed nuclear weapons as a possible deterrent from surrounding threats. Nevertheless, nuclear proliferation continued to decrease over time in the Middle East region.

I found that despite frustrations at times from allies with how the United States pursued its goal of limiting nuclear proliferation, the United States worked constantly to halt nuclear spread. Now declassified documents from the Cold War showed U.S. angst over the exploitation of NPT loopholes by regional states and policy discussions regarding how to thwart the development of nuclear weapons programs. Reports requested by the U.S. Congress from the U.S. intelligence community every six months from the mid-1990s through the early 2000s assured U.S. policymakers that the U.S. security apparatus was focused on pressing global proliferation concerns. This focus continued through the third timeframe of my dissertation: 2004 through 2013.

As I studied the proliferation history in each period, I found that more often than not the United States found a way to constrain aspiring proliferators. The tools it used to manage nuclear proliferation included economic sanctions, diplomatic negotiations, political pressure, and, at least one time, military force. The United States came to realize, however, that it needed the cooperation of other states, particularly nuclear suppliers, if it was to achieve its nonproliferation goals. This was best achieved through bilateral agreements, multilateral agreements, and organizations dedicated to combatting proliferation. Thus, beginning with the Nuclear Suppliers Group in 1975, the nonproliferation regime began to evolve, growing into its current form. There is evidence to indicate that this nonproliferation regime has helped facilitate great power cooperation against nuclear proliferation that might not have occurred otherwise and suggests that the nonproliferation regime will continue to play an important role in facilitating

nonproliferation cooperation and helping external managers to limit nuclear spread. Further, given the outsized U.S. role in creating the nonproliferation regime and managing nuclear proliferation, the United States should not shrink from active participation and management of the regime in the future. The most critical proliferation challenges most often have been tackled with U.S. leadership. A possible measure of future progress in the regime might be the initiation of innovative and effective nonproliferation measures by other major actors in the multipolar system.

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