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**STATEMENT BEFORE THE SENATE ARMED SERVICES SUBCOMMITTEE
ON STRATEGIC FORCES ON THE IMPLICATIONS FOR U.S. SECURITY OF
GROWING NUCLEAR CAPABILITIES IN THE MIDDLE EAST**

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Mr. Chairman, Senator Donnelly, Members of the Committee, thank you for inviting me to appear before you today to present my thoughts on the implications of growing regional nuclear capabilities for U.S. security. As requested, I will focus my remarks on the situation in the Middle East over the next decade.¹

U.S. SECURITY OBJECTIVES IN THE MIDDLE EAST

The United States arguably has three overriding security objectives in the Middle East. First, we have to eliminate sanctuaries for fanatical cults like ISIS from which they could mount catastrophic attacks against the U.S. homeland in the future. Second, we want to maintain access to the global economy's principal energy source. Third, we want to prevent the spread of nuclear weapons in the region, particularly to Iran, whose hostility to the United States and its partners in the region has persisted over thirty-five years since the Khomeini revolution in 1979.

These objectives cannot be viewed in isolation. For example, should ISIS solidify its gains in the region, it could not only generate an ability to mount larger-scale terrorist attacks beyond the region, but also destabilize local oil and gas producing states.

Armed with nuclear weapons, Iran could prove an even more aggressive supporter of terrorism than it has been to date. Moreover, it could also be emboldened to increase its efforts to subvert the governments of regional U.S. partners. Over time a nuclear-armed Iran could threaten vast devastation to the region's oil and gas economic infrastructure, as well as to U.S. and allied military forces operating in the Middle East. Should Iran

¹ I would like to acknowledge the very helpful research support provided by Sean Cate in the preparation of this testimony.

develop an intercontinental ballistic missile and reduce the size of its nuclear warhead, it could also pose a direct threat to the U.S. homeland.²

As I will elaborate upon presently, a nuclear-armed Iran could create a structurally unstable nuclear balance with the region's only current (albeit undeclared) nuclear power, Israel. The balance would likely become even less stable should other states in the region follow Iran's path. With this in mind, my testimony first provides an overview of current Israeli and Iranian capabilities, both in terms of weaponry and delivery systems. Second, it offers some observations on the nuclear doctrine both Israel and Iran might adopt. This is followed by my assessment of the prospective characteristics of a nuclear competition between Israel and Iran, and those of a prospective "n-player" competition should Iran's acquisition of nuclear weapons lead other states in the region to follow suit. My testimony concludes with some thoughts on what this means for the United States, to include the strategic choices we confront.

CURRENT CAPABILITIES AND DOCTRINE³

Israel

Motivation, Arsenal and Delivery Systems

Israel began seeking nuclear weapons not long after its formation. As a small country with a small population surrounded by hostile, larger neighbors, Israel's leaders felt they could not count on being able to defeat their enemies in a conventional conflict. Nuclear weapons represented a way to offset a prospective inferiority in conventional forces. The Holocaust also had a substantial impact on the thinking of Israeli leaders of that time (as it still does), and there is a determination that such an abomination should never be allowed to happen again.⁴

Although Israel has been a nuclear power for nearly half a century, it follows a policy of "nuclear opacity." Under this policy, Israel does not admit to having nuclear weapons. As a result, no publically available official statements exist regarding Israel's nuclear doctrine.

Reliable and accurate information about Israel's nuclear arsenal is also difficult to obtain given its highly secretive status. Nevertheless, credible reports generally estimate Israel possesses enough weapons-grade plutonium for one hundred to two hundred nuclear

² Of course, there would be nothing to stop the Iranians from delivering a nuclear weapon to a major U.S. port in the hold of a cargo ship, a threat that occasionally worried Cold War era planners. While the shock of an attack such as this would be great, the damage caused by detonating a weapon at or below the surface would be far less than optimal.

³ Those familiar with Israeli and Iranian capabilities may wish to proceed to the section titled, "Regional Response: Implications of a Nuclear Armed Iran."

⁴ Jeffery Goldberg, "The Point of No Return," *The Atlantic*, September, 2010, available at <http://www.theatlantic.com/magazine/print/2010/09/the-point-of-no-return/308186/>.

warheads. Some estimates place Israel's arsenal as high as three hundred nuclear warheads, composed primarily of two-stage thermonuclear devices.⁵

Most of Israel's nuclear weapons are believed to be in unassembled mode, with "fully functional weapons" capable of being constructed "in a matter of days."⁶ Israel is assessed to possess a "triad" of delivery systems that includes nuclear-capable F-16I fighters, road-mobile Jericho ballistic missiles with estimated ranges of 1,800–3,000 miles (depending on the variant),⁷ and five German-built diesel-powered Dolphin-class submarines (with one more on order).⁸

Doctrine

Israeli national security decision-makers since the late 1960s have conceived Israel's nuclear arsenal solely as a deterrent against existential threats, and not as war-fighting instruments or means of coercion.⁹ Israel's nuclear doctrine likely remains one of "defensive last resort," with procedural safeguards in place to minimize the risk of accidental or unauthorized use.¹⁰

That said, due to its lack of strategic depth and small population, Israeli military doctrine has emphasized preemption, preventive action, and fighting on enemy territory. How this would translate to nuclear doctrine against a regional power with nuclear weapons remains to be seen. To date the Israeli Defense Force (IDF) has relied on its conventional superiority to defeat its adversaries, with nuclear weapons assuming the role of "weapons of last resort" to be employed only if the country's very existence were at risk. Should Iran acquire nuclear weapons and Israel judge that such capabilities pose an existential threat, the IDF's nuclear forces could assume a substantially greater role in the country's defense planning.

⁵ International Institute for Strategic Studies (IISS), "Analysts: Israel viewed as world's 6th nuclear power," *AFP*, April 10, 2010, available at: <http://www.iiiss.org/whats-new/iiiss-in-the-press/april-2010/israel-viewed-as-worlds-sixth-nuclear-power-analysts/>. See also Goldberg, "The Point of No Return."

⁶ IISS, "Analysts: Israel viewed as world's 6th nuclear power."

⁷ "Jericho 1/2/3 (YA-1/YA-3/YA-4)," in *Jane's Strategic Weapon Systems* (London: IHS Jane's, 2012); and "Israel Test-Fires Nuclear-Capable Ballistic Missile," *Press TV*, September 8, 2013, available at: <http://www.presstv.ir/detail/2013/07/13/313543/israel-test-fires-nuclearcapable-missile/>; and "Jericho 1/2/3 (YA-1/YA-3/YA-4)," in *Jane's Strategic Weapons Systems* (London: IHS Jane's, 2015).

⁸ Robert Farley, "Nukes on the High Seas: Israel's Underwater Atomic Arsenal," *The National Interest*, October 9, 2014, p. 1, available at <http://nationalinterest.org/feature/nukes-the-high-seas-israels-underwater-atomic-arsenal-11434>; and Barbara Opall-Rome, "Israel Inaugurates 5th Dolphin-Class Sub," *Defense News*, April 29, 2013, available at: <http://www.defensenews.com/article/20130429/DEFREG04/304290008/Isra-el-Inaugurates-5th-Dolphin-Class-Sub>.

⁹ Avner Cohen, "Nuclear Arms in Crisis under Secrecy: Israel and the Lessons of the 1967 and 1973 Wars," in Peter R. Lavoy, Scott D. Sagan, and James J. Wirtz, eds., *Planning the Unthinkable: How New Powers Will Use Nuclear, Biological, and Chemical Weapons* (Ithaca, NY: Cornell University Press, 2000), pp. 123–124.

¹⁰ Avner Cohen and Marvin Miller, "Bringing Israel's Bomb out of the Basement," *Foreign Affairs*, September/October 2010, p. 39.

Command and Control: Authority

Command authority for the use of nuclear weapons almost certainly rests with the prime minister. However, specific lines of authority are not known.¹¹ One report states “Israel has an elaborate civilian-controlled [command-and-control] C2 system, which requires three layers of approval to be activated.”¹² The one instance where there is publically available information on Israeli considerations of nuclear weapons use involves the 1973 Yom Kippur War. The accounts make it clear that the final decision was then Prime Minister Golda Meir’s.¹³

Command and Control: Early Warning

Israel has advanced, networked command-and-control systems that are linked by satellite, fiber, and radio communications. Some command-and-control centers, such as the Israeli Air Force’s operational command bunker in Tel Aviv, are believed to be hardened to withstand nuclear attack.¹⁴

Israel has an extensive early warning system that is integrated with its ballistic missile defenses. Its Elta Green Pine early warning and fire control radar for the Arrow anti-missile system can track targets out to 500 km. The U.S.-controlled AN/TPY-2 radar deployed to Israel has a detection range of over 4,500 km against ballistic missiles and can detect a launch from Iran within seconds. However, the U.S. controls this facility and shares the information it provides with Israel at its discretion. The Israeli military does operate its own reconnaissance satellites, some of which may be able to provide early warning, and it has modern airborne early warning and control aircraft.¹⁵

¹¹ Bennett Ramberg, “Wrestling With Nuclear Opacity,” *Arms Control Today*, The Arms Control Association, November 4, 2010, available at http://www.armscontrol.org/act/2010_11/BookReview.

¹² Shahram Chubin, *Command and Control in a Nuclear-Armed Iran*, Proliferation Papers No. 45 (Paris: Institut Français des Relations Internationales, 2013), available at <http://www.ifri.org/sites/default/files/atoms/files/pp45chubin.pdf>.

¹³ Jeffrey Lewis, “Israel, Nuclear Weapons and the 1973 Yom Kippur War,” *Arms Control Wonk*, October 21, 2013, available at <http://lewis.armscontrolwonk.com/archive/6909/israel-nuclear-weapons-and-the-1973-yom-kippur-war>.

¹⁴ “Israel: Upgraded Air Force command center can withstand nukes,” *I24News*, December 14, 2014, available at <http://www.i24news.tv/en/news/israel/diplomacy-defense/54399-141214-israel-new-air-force-command-center-can-withstand-nukes>.

¹⁵ “Arrow 2 Theatre Ballistic Missile Defense System, Israel,” *Army-Technology*, accessed February 17, 2015 at <http://www.army-technology.com/projects/arrow2/arrow23.html>; Karl Vick and Aaron J. Klein, “How a U.S. Radar Station in the Negev Affects a Potential Israel-Iran Clash,” *Time*, May 30, 2012, available at <http://content.time.com/time/world/article/0,8599,2115955,00.html>; “CAEW Conformal Airborne Early Warning Aircraft, Israel,” *Airforce-Technology*, accessed February 16, 2015 at <http://www.airforce-technology.com/projects/caew/>; “Israel—Air Force” *Jane’s World Air Forces*, IHS Jane’s; and Brian Berger, “Israeli Rocket Launches Radar Reconnaissance Satellite,” *Space News*, April 10, 2014, available at <http://spacenews.com/40170israeli-rocket-launches-radar-reconnaissance-satellite/>.

Iran

Motivation and Delivery Systems

Iran's rationale for seeking nuclear weapons has several possible elements, none of which preclude the others. One is regime preservation in the face of a hostile superpower in the form of the United States, a nuclear-armed enemy in Israel, Sunni Arab rival states, and a neighbor, Turkey, which aspires to expand its influence in the region. Yet Iran could also seek nuclear weapons to support its revisionist goal of reordering the regional geopolitical order with itself at the head, bolstering the regime's sagging domestic legitimacy. Nuclear weapons could enable Tehran to increase its efforts to coerce other states and to expand its support for proxies with less fear of reprisals.

At least initially, Iranian nuclear weapons are likely to rely on a simple design. Such a device would resemble first-generation implosion devices and have a low yield of around 20 kt (slightly more than the Trinity test shot conducted by the United States on July 16, 1945) and a weight of about 1,000 kg (or 2,200 pounds).¹⁶ According to some estimates, Iran probably has enough low-enriched uranium to make seven such weapons upon further enrichment, and it could enrich enough additional material for one bomb every two months. Should Iran's supreme leader give authorization, it could likely convert sufficient low-enriched uranium to high-enriched uranium and assemble a bomb within a year.¹⁷

What can be stated with a high degree of confidence is that, in addition to its efforts to produce plutonium and enrich uranium to weapons-grade levels, Iran has also been purchasing or developing and fielding delivery systems that would likely comprise part of an overall nuclear force posture. Principal among these capabilities are its ballistic missiles. It seems unlikely, however, that Iran has the financial means, requisite technology, or sufficient skilled manpower to field, man, and maintain a state-of-the-art early warning and command and control network of the kind required to deal effectively with the highly compressed warning times associated with an Israeli ballistic missile nuclear attack.

¹⁶ "Iran's Nuclear Timetable," *Iran Watch*, December 2, 2014, available at <http://www.iranwatch.org/our-publications/articles-reports/irans-nuclear-timetable>; and Abdullah Toukan and Anthony Cordesman, *Iran's Nuclear Missile Delivery Capability* (Washington, DC: Center for Strategic and International Studies, 2014), pp. 5, 10.

¹⁷ Based on the calculation that it could produce a 20 kt yield using 16 kg of highly enriched uranium. "Iran's Nuclear Timetable," *Iran Watch*; and Thomas B. Cochran and Christopher E. Paine, *The Amount of Plutonium and Highly-Enriched Uranium Needed for Pure Fission Nuclear Weapons* (Washington, DC: Natural Resources Defense Council Inc., 1995) Table 1, available at <https://www.nrdc.org/nuclear/fissionw/fissionweapons.pdf>; "Iran's Nuclear Timetable," *Iran Watch*; and Julie Pace, "Obama says Iran at least a year from getting bomb," *The Boston Globe*, October 7, 2013, available at <http://www.bostonglobe.com/news/nation/2013/10/07/obama-says-iran-year-more-from-getting-bomb/MNBOHNW4ffkvONE24hRp1L/story.html>. Although the last estimate is somewhat dated, it probably reflects the time for Iran to convert its low enriched uranium to highly enriched uranium and weaponize it, rather than any fixed timeline along which Iran may be proceeding.

Based on Tehran's recent and ongoing military efforts, an initial Iranian nuclear force would probably rely heavily on road-mobile ballistic missiles, such as the Shahab 3, as the principal form of delivering nuclear weapons to targets in Israel.¹⁸ At least some of Iran's ballistic missiles are placed in underground silos. Others are kept on transporter/erector launchers (TELs) concealed in caves and bunkers.¹⁹ It is unlikely that Iran has the ability to produce a warhead small enough to fit on a cruise missile. Since Iran's existing missile forces do not appear accurate enough to destroy hardened or buried targets (e.g., missile silos),²⁰ Tehran's initial nuclear weapons would likely be targeted against "soft" counterforce (e.g., unhardened naval and air bases) and especially countervalue (e.g., population and economic infrastructure) targets. It would also appear likely that, at least initially, Israel would be the primary and perhaps exclusive target of Iran's nuclear forces, although targets in Saudi Arabia and other Gulf states, as well as U.S. military bases in the region could also be placed at risk.

Doctrine

Given Tehran's repeated declarations that it is not developing nuclear weapons, there is nothing in the public domain in the way of an official statement as to what its nuclear doctrine might be.

Command and Control: Authority

There is little information on Iranian command and control systems, let alone on what a prospective Iranian nuclear command and control system might look like. There are reports of Iran recently fielding indigenously produced tactical command and control systems that can integrate command and control centers and early warning, air defense, and missile strike systems. These could be linked via fiber/wired and wireless connections to multi-layered communications networks that provide short-, medium-, and

¹⁸ Iran has fourth generation fighters, such as F-14s and MiG-29s. However, without aerial refueling, they would be unable to reach Israel with a nuclear bomb payload (although they could be sent on a one-way "suicide" mission or attempt to recover in Lebanon or Syria). They would also likely be highly vulnerable to Israel's air defenses.

¹⁹ The United States Institute of Peace, "US Intel Assessment," in *The Iran Primer* (Washington, DC: United States Institute of Peace, 2014), available at <http://iranprimer.usip.org/blog/2014/feb/01/us-intel-assessment>; and Michael Connell, "Iran's Military Doctrine," in *The Iran Primer* (Washington, DC: United States Institute of Peace, n.d.), accessed on February 15, 2015 at <http://iranprimer.usip.org/resource/irans-military-doctrine>

²⁰ The mainstay of Iran's long-range missile force is currently the Shahab 3, which is inertially guided and believed to have a circular error probable, or CEP, of roughly 8,000 feet (1.5 miles), although some analysts believe it may be as low as 600 feet. This means that Shahab 3 missiles will land within this distance (i.e., between 600-8,000 feet) of their target 50 percent of the time. When delivering nuclear weapons, this degree of accuracy is "good enough" for large, "soft" targets like cities or airbases. Destroying underground bunkers and missile silos, however, requires a much higher degree of accuracy or significantly higher-yield weapons. "Shahab 3," *Missile Threat*, available at: <http://missilethreat.com/missiles/shahab-3/>; and "Shahab-3/Zelal-3," *Federation of American Scientists*, October 1, 2013, available at: <http://www.fas.org/programs/ssp/man/militarysumfolder/shahab-3.html>.

long-range encrypted communications. Iran also has a network of underground command and control facilities.²¹

Command and Control: Early Warning

Iran's early warning system appears incapable of providing reliable detection of low-observable aircraft; however, it is assessed to be effective against fourth generation fighters. Most notably, three long-range early warning radars have been constructed in the past few years—two Ghadir radars with 1,000 km ranges and one Sepehr radar with a 3,000 km range. They provide 360-degree coverage of the entire country and significant coverage of the region. Tehran claims these radars can detect and identify aircraft, cruise missiles, ballistic missiles, and low-altitude satellites. There is an additional network of twenty-four shorter-range early warning radars located throughout the country.²² Assuming these capabilities function “as advertised,” Iran could have warning of a ballistic missile strike or non-stealthy cruise missile strike.

REGIONAL RESPONSE: IMPLICATIONS OF A NUCLEAR ARMED IRAN

A Bipolar Nuclear Balance

Should Iran acquire a nuclear capability, any assumption that mutual deterrence and strategic stability could be established between Iran and Israel along the lines of that which characterized the U.S.-Soviet Cold War competition should be viewed with skepticism. Based on the historical record of the Cold War and the circumstances in which Iran and Israel would find themselves, a nuclear competition between them will not necessarily curb risk-taking. There are several instances during the Cold War where one protagonist greatly miscalculated the other's willingness to take such risks.²³ Moreover, there is no compelling evidence that Iranian and Israeli leaders have a clear sense of how the other side calculates cost, benefit, and risk—the factors that form the basis of a deterrent posture. Nor does it seem likely at this point that they would engage in confidence-building measures to promote such an understanding if Iran were to field a nuclear weapons capability.

Israel's lack of strategic depth presents it with an enduring and supreme vulnerability, fundamentally different the vast territorial depth enjoyed by both the United States and

²¹ Sara Rajabova, “Iran unveils new command, control systems,” *Azernews*, May 26, 2014, available at <http://www.azernews.az/region/67421.html>; “Iran unveils new air defense command systems,” *Trend*, May 26, 2014, available at <http://en.trend.az/iran/2278250.html>; and William J. Broad, “Iran Shielding Its Nuclear Efforts in a Maze of Tunnels,” *The New York Times*, January 5, 2010, available at http://www.nytimes.com/2010/01/06/world/middleeast/06sanctions.html?pagewanted=all&_r=0.

²² “Sealing off skies: Iran finalizes 360 degree early warning air defense radar,” *RT*, February 15, 2015, available at <http://rt.com/news/232515-iran-sepehr-radar-installed/>; and Joseph S Bermudez, Jr., “More long-range Iranian early-warning radars revealed,” *IHS Jane's 360*, September 4, 2014, available at <http://www.janes.com/article/42794/more-long-range-iranian-early-warning-radars-revealed>; and Sean O'Connor, “Strategic SAM Deployment in Iran,” *Air Power Australia*, April, 2012, available at <http://www.ausairpower.net/APA-Iran-SAM-Deployment.html#mozTocId484494>.

²³ The October 1962 Cuban Missile Crisis is perhaps the best example of risk-taking that brought the two nuclear powers perilously close to nuclear war.

Soviet Union during the Cold War. In terms of a nuclear strike, Israel has been described as a “one-bomb” country. While this may be an overstatement, a few nuclear detonations over cities like Tel Aviv and Haifa would represent the end of Israel as a viable state. Of course, in the event of such an attack Iran could count on being subjected to a devastating Israeli nuclear counterstrike. Thus Iran in principle would be deterred from initiating a nuclear conflict. Again, however, it is not clear how Iran’s leaders would view nuclear weapons use. For example, former Iranian president Hashemi Rafsanjani argued that, “One nuclear bomb inside Israel will destroy everything, [but Israel’s retaliation] . . . will only harm the Islamic world. It is not irrational to contemplate such an eventuality.”²⁴

Considering its inability to absorb even a limited nuclear attack of a half dozen or so warheads and the limitations of ballistic missile defenses, Israel will likely seek to maintain as long as possible the option of executing a decisive, preemptive nuclear attack against Iran’s nuclear arsenal if it believes an attack is imminent. Israeli leaders recognize that a first strike against Iran would likely be met with universal condemnation from the international community. Nevertheless, if the very survival of the state of Israel were at stake, then the costs of failing to execute a first strike would likely be viewed as far exceeding the benefits of exercising restraint. Accordingly, Israeli decision-makers will have strong incentives to pursue a counterforce capability in addition to a countervalue (“assured destruction”) capability. Yet Iran’s mobile missile launchers would very likely present significant challenges to Israeli efforts at counterforce targeting. The Israelis’ problems could be further compounded if the Iranians hide some missiles in underground shelters, or acquire the technology to deploy nuclear-tipped cruise missiles at sea. As Iran’s nuclear arsenal becomes more survivable through their growing numbers and/or diversification of delivery systems, the challenges associated with Israel maintaining a preemptive nuclear posture would only worsen.

Even assuming both Israel and a nuclear-armed Iran would seek to avoid nuclear use, geographic realities combined with missile speed may conspire to undermine their efforts. Ballistic missile flight times between the two countries are so short that even advanced early warning and command and control systems are likely to be inadequate to enable their leaders to have confidence that they can confirm the attack, decide upon an appropriate response, and issue the commands for executing the response. The problem may not be acute in the course of day-to-day or steady state activities; however, in the event of a crisis, these factors may create an incentive to strike first.

The short warning times could pressure both sides to adopt a heightened alert status, especially in a crisis. Israel could choose to do so in order to preserve the option of launching a decisive pre-emptive first strike, while Iran would do so to avoid becoming the victim of such an attack. To the extent either side seeks to resolve the problem by placing its forces on a hair-trigger alert or extending nuclear release authority to lower

²⁴ Thomas C. Reed and Danny B. Stillman, *The Nuclear Express* (Minneapolis, MN: Zenith Press, 2009), p. 298.

commands, the risk of accidental launch or miscalculation would inevitably increase, especially during a crisis.

The prospects for avoiding nuclear use might be enhanced if, over time, both Israel and Iran fielded secure second-strike forces capable of inflicting assured destruction.²⁵ Yet even after both the United States and the Soviet Union accumulated vast numbers of nuclear weapons during the Cold War, fears continued to persist on both sides regarding their vulnerability to a disarming first strike.

An “N-State” Nuclear Competition?

It is possible—perhaps even likely—that Iran’s acquisition of a nuclear capability would not only produce a nuclear competition with Israel, but also prompt other states in the region to acquire nuclear weapons, creating a multipolar, or “n-state,” nuclear competition. While the path toward a nuclear capability has historically been long and arduous, this may not be the case in the wake of Iran’s ascension to nuclear power status. Such a shock to the nonproliferation regime could, in fact, precipitate its collapse. Saudi Arabia might exercise what some believe to be a standing option to acquire nuclear weapons from Pakistan or base Pakistani nuclear weapons on its territory with Riyadh exercising de facto control.²⁶ Or nuclear proliferation might occur on an accelerated schedule, with designs, components, and even fissile material—everything but an assembled warhead itself—being provided on an “installment plan” in a market where the barriers to transfer have all but collapsed.²⁷

²⁵ Assured destruction as defined here refers to the ability to inflict casualties and economic damage against a state such that it is annihilated as a functioning entity.

²⁶ Saudi King Abdullah stated, “If Iran developed nuclear weapons . . . everyone in the region would do the same.” A similar statement was made by Prince Turki al-Faisal, former head of Saudi Arabia’s General Intelligence Directorate. In 2012, a senior Saudi source declared, “There is no intention currently to pursue a unilateral military nuclear program but the dynamics will change immediately if the Iranians develop their own nuclear capability. . . . Politically, it would be completely unacceptable to have Iran with a nuclear capability and not the kingdom.” On the persistent but unconfirmed reports of a Saudi-Pakistani nuclear connection, see Naser al-Tami-ni, “Clear or Nuclear: Will Saudi Arabia Get the Bomb?” *Al Arabiya*, May 21, 2013, available at: <http://english.alarabiya.net/en/News/middle-east/2013/05/21/Will-Riyadh-get-the-bomb-.html>. See also *Chain Reaction: Avoiding a Nuclear Arms Race in the Middle East*, Report to the Committee on Foreign Relations, United States Senate (Washington, DC: Government Printing Office, 2008), pp. ix, 12, 20; and Ibrahim al-Marashi, “Saudi Petro-Nukes? Riyadh’s Nuclear Intentions and Regime Survival Strategies,” in William C. Potter and Gaukhar Mukhatzhanova, eds., *Forecasting Nuclear Proliferation in the 21st Century, Vol. II: A Comparative Perspective* (Stanford, CA: Stanford University Press, 2010), pp. 77–78.

²⁷ Take the example of what Pakistan alone has provided and could provide to accelerate the rate of proliferation. It has, via the A.Q. Khan network, seeded parts of the developing world with nuclear weapon designs and key components (e.g., centrifuges). See *Nuclear Black Markets: Pakistan, A.Q. Khan and the Rise of Proliferation Networks: A Net Assessment* (London: International Institute for Strategic Studies, 2007). See also David Albright, *Peddling Peril: How the Secret Nuclear Trade Arms America’s Enemies* (New York: Free Press, 2010). Moreover, Pakistan’s projected production of plutonium will far exceed its projected arsenal’s requirements. There are reports that Pakistan may have completed a second nuclear plutonium production reactor (Khushab-II) near Khushab, which is the site of the country’s first plutonium production reactor (Khushab-I). A third reactor, Khushab III, is under construction. The two reactors are estimated to produce roughly 22 kg of plutonium a year, enough for 10 nuclear weapons. Assuming the third reactor is similar in design to the second (which it appears to be), within a few years Pakistan will be producing enough plutonium for thirty or more nuclear weapons each year. Paul K. Kerr and Mary Beth

Despite the uncertainties regarding which path the region will follow toward a multipolar nuclear competition once Iran achieves nuclear-armed status, several things seem clear. First, even if Saudi Arabia, Turkey, and/or Egypt were to follow Iran into the nuclear club, over the near-term, Israel would likely to maintain a dominant position in which its nuclear arsenal and capabilities far outstrip those of its neighbors. Absent a large-scale transfer of nuclear weapons from an established nuclear power to a regional nuclear aspirant, for perhaps a decade or so Israel's arsenal would likely far exceed the combined arsenals of all other nuclear powers in the region both in terms of the numbers of nuclear weapons and their respective yields. While Israel might lose its formidable advantage over time, early on it will likely maintain a very robust preventive strike capability as well as an assured destruction capability, especially considering that its rivals will also likely lack effective air and missile defenses, early warning, and command and control systems. Yet Tel Aviv would also confront the hard reality that still more countries in the region will have the ability, even with only a handful of nuclear weapons, to inflict devastating damage on the Israeli people and their economy.

A "Nuclear Great Game"

Some declared and undeclared nuclear powers, as well as non-nuclear powers that nevertheless have capable civilian nuclear enterprises outside the Middle East, might have strong incentives to assist states in the region seeking to create or enhance their nuclear posture. The region possesses the world's greatest concentration of oil and natural gas, which are critical to global economic growth. The region is a key geostrategic location, with several maritime trade chokepoints such as the Suez Canal, Strait of Hormuz, and Bab el-Mandeb. Given their dependence on oil and natural gas to fuel their economies, the major powers of the developed and developing world have strong incentives to seek access to and influence in that region. In a proliferated Middle East, this could be achieved in a number of ways, to include assisting local states' efforts to develop a nuclear weapons program, enhancing their existing nuclear forces, and/or providing competing nuclear security guarantees, any of which could further destabilize the region.

This could result in a latter-day "Nuclear Great Game" where states external to the region compete for power and influence within it. In such an environment there could be many potential suppliers of nuclear weapons-related technology. Not all extra-regional suppliers would necessarily have a strong interest in regional stability. Major oil and gas exporters outside the region, Russia in particular, could potentially benefit from the corresponding increase in oil and gas prices that would accompany instability. Thus

Nikitin, *Pakistan's Nuclear Weapons: Proliferation and Security Issues* (Washington, DC: Congressional Research Service, June 2012), pp. 5–6, 26–27. See also Christopher Clary and Mara E. Karlin, "The Pak-Saudi Nuke, and How to Stop It," *American Interest*, July–August 2012, pp. 24–31.

Moscow may be far less concerned about the consequences of its actions on regional stability.²⁸

Among the technologies and capabilities that are likely to be in highest demand by new nuclear powers in the region are those related to warhead miniaturization and precision guidance, missile defenses, and various forms of intelligence (e.g., early warning; rival force development), while thermonuclear weapons, MIRV technology, depressed trajectory ballistic missiles, and missile-carrying submarines are apt to be accorded lesser priority.

Even those states with an interest in stability may not act in their own best interests. States have been prone to act in ways that value narrow, short-term interests at the expense of more important long-term interests.²⁹ For example, states like Pakistan or North Korea that are financially strapped may act primarily out of an immediate need for revenue and discount heavily the longer-term consequences of their actions on regional stability and even their own long-term security. Nor can China be counted upon to exercise restraint, given its history of enabling nuclear programs in North Korea and Pakistan.³⁰

Perhaps most worrisome from Washington's perspective, the opportunities for other powers to displace its influence could increase dramatically if the United States (and perhaps its allies as well) were to withhold military support for nuclear-armed states in an effort to shore up the NPT regime. Should these efforts fail the United States could end up in the worst of both worlds: failing to achieve its nonproliferation goals while also losing influence with regional nuclear powers to extra-regional rivals.

The "N-State" Competition and Crisis Stability

In a Middle Eastern "n-player" competition, all nuclear powers would be challenged to establish an "assured destruction" capability against all the other regional nuclear powers—another Cold War desideratum—given their relatively modest economies. An "assured destruction" capability in an "n-state" competition would require that each state have weapons sufficient to survive an initial attack by *all* potential rivals and still be able to devastate the countries of *all* potential attackers. It would also require that the source of the attack be reliably identified. This may prove difficult given likely limitations on these states' ability to field advanced early warning systems. For example, would Saudi Arabia be able to determine with confidence the perpetrator of a ballistic missile

²⁸ This is not to say that Russia would seek to promote a nuclear war, or even a nuclear crisis. Yet, as has been described above, political leaders are not always the masters of events once they are put in motion.

²⁹ For example, in the nuclear competition alone, China's support for Pakistan's nuclear program appears to be a case of pursuing short-term geopolitical gains at the expense of potentially far greater long-term problems, as described in this paper. Arguably, the U.S. pursuit of multiple independently targetable reentry vehicles (MIRV) technology, rather than first attempting to ban it through arms control agreements, proved short sighted, as it ultimately worked to the relative benefit of the Soviet Union, whose far larger ballistic missiles could accommodate more warheads than their U.S. counterparts.

³⁰ See Reed and Stillman, *The Nuclear Express*, pp. 328–29.

launched from a location along the Iranian-Turkish border? The origin of any cruise missile launched from a sea-based platform? Even assuming a state could identify the source (or sources) of an attack, could its command and control systems survive the attack sufficiently intact to execute a retaliatory strike? A decapitation strike could preclude an “assured destruction” retaliatory strike even if sufficient weapons survive to execute one.

This, in turn, raises the possibility of a “catalytic” war—one that is initiated between two states by a third party. Given a proliferated Middle East as described here, the chances that a regime would incorrectly attribute the source of an attack cannot be easily dismissed. To the extent cyber weapons could be employed to introduce false information into a state’s decision-making process, the risks of catalytic war only increase.

Further complicating matters, the early warning requirement following a proliferation cascade could be multidirectional, and at some point perhaps 360 degrees, especially if multiple nuclear rivals deploy a portion of their nuclear forces at sea. Early warning requirements would be stressed even further if an adjacent state (e.g., Saudi Arabia in the case of Iran) were to acquire nuclear weapons. In this case warning times would be even more compressed than in an Israeli-Iranian competition. Owing to its proximity to Iran, Saudi Arabia, for example, could have less than five minutes to react to a suspected Iranian ballistic missile attack no matter how advanced its early warning and command and control systems.

As noted earlier, regardless of what assumptions are made with respect to a regional nuclear power’s early warning system, given the short ballistic missile flight times, it seems likely that preserving command and control of the state’s nuclear forces while under attack will prove challenging. States might be tempted to adopt a launch-on-warning posture, but this requires both early warning and a highly responsive command and control system. Should a state determine that it will not be able to launch-on-warning and instead attempt to “ride-out” a nuclear first strike and retaliate, it would still need its command and control system to function effectively in the wake of the nuclear attack. Absent a highly resilient command and control system, a state’s ability to launch a retaliatory nuclear strike may require nuclear release authority to be diffused to lower-level commanders. But again, absent an effective early warning system it may not be possible to determine the attack source with confidence in a region with multiple nuclear powers.

Finally, a state could forego a prompt counterstrike in favor of responding days or even weeks following an attack. In theory there is no reason why a nuclear counterstrike would have to be prompt if it were focused solely on punishing the attacker through strikes on counter-value targets. Following this line of reasoning, a regime could hide its nuclear weapons and launchers, recover them in the days following an attack, and launch its retaliatory blow once its surviving nuclear forces had been reconstituted.

While this “buried bomb” posture might be appealing in the abstract, there are significant potential drawbacks that must be addressed. First, the country adopting this posture

would have to be able to identify the source of the attack. Second, depending upon the attacker's nuclear arsenal, a time delay may enable a follow-on strike. Third, there would always be a risk that the buried bombs would be located and destroyed in the initial attack or in the follow-on strike. Fourth, the nuclear weapons might even be physically seized by the attacker's conventional or special operations forces following the first strike during what would almost certainly be a period of widespread disorder in the state that had been attacked. Fifth, a coherent command and control system would need to be maintained, not only during the minutes or hours immediately following an attack, but also for days or weeks. Failing that, the state's leadership would likely have to devolve nuclear release authority to lower commands. While this could enhance the prospects of a successful buried bomb retaliatory strike, it would almost certainly increase the risks of an unauthorized or accidental use of nuclear weapons.

SOME IMPLICATIONS FOR U.S. POLICY AND FORCE POSTURE

Given the current state of Iran's nuclear program, the immense resources Iran's leaders have invested in it, the great lengths to which they have gone to deceive the international community regarding their nuclear program, and the substantial advantages that would accrue to Tehran from possessing nuclear weapons, it seems unlikely that anything short of the threat or use of force would deflect the current regime from its objective. Even if the United States and Iran concluded an agreement on Iran's nuclear program in the coming days or weeks, it seems unlikely to alter Tehran's ultimate aim.

If so, these circumstances would leave the United States and its security partners with two basic strategic choices: compel the Tehran regime through the threat or the use of force to abandon its nuclear weapons program, or prepare to live with whatever nuclear posture Iran chooses to adopt, which could range from a "short sprint" to a nuclear capability; an opaque nuclear posture similar to Israel's; or a declared nuclear capability such as North Korea's or Pakistan's.

I will focus my remarks here on the challenges associated with a nuclear-armed Iran. First, I offer some suggestions as to the kind of analyses we might want to do to help insure that we make the best of what is likely to be a difficult situation. Second, I present some thoughts as to what the character of a nuclear competition in the Middle East might imply for U.S. security policy and strategic force posture.

Before proceeding, however, I want to make clear that crafting a well-designed U.S. policy, strategy, and associated force posture in the wake of Iran becoming a nuclear-armed state would be a formidable task, requiring persistent, focused intellectual effort by skilled strategists, as well as execution by highly skilled diplomats and military leaders.

Determining the appropriate U.S. policy, strategy, and military posture in this regard might be usefully informed by assessments of the following issues:

- Developing as best an understanding as possible regarding how Israel and the region's prospective nuclear powers view nuclear weapons, to include the conditions under which they might be employed and how their decision-makers

tend to view costs, benefits, and risks (e.g., What do they value most, such as regime survival? What do most fear? How risk tolerant/risk averse are they? Do their worldviews match ours? Etc.)

- Identifying and evaluating a set of scenarios that address the prospective immediate and long-term consequences of a U.S./allied use of force to preclude Iran from acquiring nuclear weapons.
- Identifying and evaluating a set of scenarios that address a regional bipolar nuclear competition between Israel and Iran, to include potential crisis situations as well as a steady state, long-term competition to include the second-order effects on the region (such as an expanded use of proxy warfare by Tehran).
- Identifying and evaluating a set of scenarios that address the prospective emergence of an “n-state” nuclear competition in the region, to include potential crisis situations as well as a steady state, long-term competition to include the second-order effects on the region (such as in the event external major powers engage in a “Nuclear Great Game” for influence in the region).
- Undertaking an assessment of the implications of these prospective futures for U.S. security interests in the region, as well as our force posture and associated capabilities.

In structuring the kinds of assessments and planning scenarios described above, consideration should be given to a range of key factors shaping the nuclear competition, to include the dynamics of "n-player" competitions, the progressive blurring of the “firebreak” between nuclear and advanced conventional weaponry, and geography, to name a but a few.

The U.S. Nuclear Arsenal and Extended Deterrence

Should Iran acquire a nuclear capability, the United States might look to stretch its nuclear umbrella over friendly states in the Middle East in order to enhance their sense of security and reduce their incentive to obtain their own nuclear weapons. This would likely raise familiar issues regarding the size and composition of the U.S. nuclear arsenal, as well as Washington’s credibility.

Let’s take the last issue first. During the Cold War, America’s NATO allies questioned whether Washington would risk a Soviet nuclear attack on Chicago by retaliating for a Soviet nuclear attack on Bonn. In the event of a nuclear-armed Iran, one might suspect Saudi leaders challenging Washington’s willingness to order a nuclear response against Tehran should Riyadh be the target of an Iranian nuclear-tipped missile—particularly if Iran had acquired an ability to strike the United States.

The U.S. ability to assure those countries to which it proposes to offer extended deterrence may also depend to a significant extent on the mix of nuclear weapons in its arsenal. While many other nuclear powers—China and Russia in particular—are investing in advanced nuclear designs, to include weapons with very low yields and more focused effects, the United States has chosen to limit its nuclear weapons inventory to weapons designed during the Cold War. By limiting the range of nuclear response

options available to the president, this posture may run a significant risk of weakening the U.S. ability to deter its enemies as well as the credibility of U.S. extended deterrence guarantees to allies and partners.

Given the dramatic reductions in the U.S. nuclear arsenal since the Cold War, questions might also arise as to how thinly America's nuclear umbrella is stretched. New START provides the United States parity with Russia in numbers of strategic nuclear weapons. Moscow, however, has not sought to extend nuclear guarantees to other states, while the United States has done so with its European allies, and other allies such as Japan and South Korea—presumably to counter any threat that might be posed by China and/or North Korea. When the United States had thousands of nuclear weapons, one might discount the matter. With the New START commitment to reduce the arsenal size to 1,550, and with the administration floating proposals to reduce the number further to 1,000, one can understand why those offered shelter under the U.S. nuclear umbrella are beginning to wonder if it leaks. Put another way, the United States has nuclear parity with Russia, but it is also committed to defend allies and partners against nuclear threats posed by China, North Korea, and, prospectively, Iran as well.

Thank you again for the opportunity to share my thoughts on these important issues. I will be happy to respond to any questions you might have to the best of my ability during the discussion period.

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