

# CHAPTER 5

## The Next Nuclear War

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Since the United States dropped atomic bombs on Japan at the close of World War II, world leaders have had the wisdom to avoid another nuclear war. Humanity witnessed the terrifyingly destructive power of nuclear weapons at Hiroshima and Nagasaki and vowed never to repeat the mistake. The Cold War superpowers set up effective international systems to control the spread of nuclear technology and prevent the proliferation of nuclear weapons to additional countries. While there are a handful of states that possess nuclear weapons today, none of them are run by leaders so irrational or suicidal as to intentionally launch a nuclear attack. Moreover, these countries have put in place prudent policies and technologies to prevent an accidental or unauthorized nuclear launch. The upshot of these developments is that nuclear weapons have not been used in seventy years and we have little reason to fear that they will ever be used again.

This line of thinking is certainly comforting, but is it correct? The fact is that nuclear weapons and international conflict continue to exist. The number of nuclear-armed states has slowly grown over time and, outside of the United States and Europe, the nuclear powers are increasing the size and sophistication of their nuclear

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arsenals, as well as their reliance on nuclear weapons in military doctrine and strategy. Indeed, recent years have seen an increase in overt nuclear threats by some leaders. Political tensions remain among nuclear powers and in many regions of the world these conflicts are becoming more intense. In addition, poorly safeguarded nuclear material around the globe could find its way to extremist organizations that could use nuclear weapons as an instrument of terror. While the risk of nuclear war on any given day is low, it is not zero. And this risk must be multiplied across many nuclear-armed actors and international conflicts for years to come. In sum, there is a frighteningly real risk that humanity has not witnessed its last nuclear war.

This article will examine the prospects for the next nuclear war. It will begin by defining our key concept: nuclear use. Next, it will review the first and only instance of nuclear use, the dropping of atomic bombs on Hiroshima and Nagasaki in World War II, to assess whether the pathway to the first and only existing case of nuclear use might be repeated. It then articulates the theoretical processes that could give rise to nuclear war as identified in the international relations and nuclear deterrence literatures. Next, in order to identify the flashpoints that could result in the next nuclear exchange, it examines the most salient geopolitical rivalries between nuclear-armed actors in the world today. Finally, it offers concluding remarks regarding the steps world leaders can take to prevent future nuclear wars.

### *Defining Nuclear Use*

We begin by defining a key term: nuclear use. We define nuclear use as the detonation of a nuclear weapon against an enemy target. Some U.S. Department of Defense officials declare that “Nuclear weapons are used every day,” to emphasize that nuclear weapons play an important and enduring role in maintaining strategic deter-

rence and keeping the peace.<sup>2</sup> Similarly, scholars have explored the deterrent, coercive, and symbolic effects of nuclear weapons.<sup>3</sup> We do not mean nuclear use in this sense. We also exclude from our definition nuclear tests or nuclear demonstration shots that could be used for political effect, but that do not result in death or destruction. Rather, for the purposes of this chapter, nuclear use is defined as a nuclear attack resulting in physical damage of enemy targets.

### *Nuclear Use in World War II*

When considering the next use of nuclear weapons, the most logical place to begin is the last and only instance of nuclear use, the U.S. atomic bombing of Japan at the end of World War II. Understanding U.S. President Harry Truman's decision to employ nuclear weapons in warfare may shed some light on why leaders might consider nuclear use in the future.

On August 6, 1945, the United States dropped an atomic bomb on Hiroshima and, three days later, on August 9, a second weapon was

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2. For example, former U.S. Defense Secretary James Schlesinger makes this point in Melanie Kirkpatrick's article, "Why We Don't Want a Nuclear-Free World," *Wall Street Journal*, July 13, 2009, available from [www.wsj.com/articles/SB124726489588925407](http://www.wsj.com/articles/SB124726489588925407).

3. See, for example, Matthew Kroenig, "Nuclear Superiority and the Balance of Resolve: Explaining Nuclear Crisis Outcomes," *International Organization* 67, No. 1 (January 2013): 141-171; Glenn Snyder and Paul Diesing, *Conflict Among Nations: Bargaining, Decision-Making, and System Structure in International Crises* (Princeton, NJ: Princeton University Press, 1977); Richard Betts, *Nuclear Blackmail and Nuclear Coercion* (Washington, DC: Brookings Institution Press, 1987); Marc Trachtenberg, *History and Strategy* (Princeton, NJ: Princeton University Press, 1991); Kyle Beardsley and Victor Asal, "Winning with the Bomb," *The Journal of Conflict Resolution* 53, No. 2 (April 2009): 278-301; Carol Atkinson, "Using nuclear weapons," *Review of International Studies* 36 (2010): 839-851; and R. Davis Gibbons, "Signals Intelligence? The Effectiveness of Nuclear and Non-Nuclear Signals in a Crisis" (Washington, DC: Center for Strategic and International Studies, 2012).

used against Nagasaki. Almost seventy years after the event, historians continue to debate the motivations behind Truman's decision.<sup>4</sup> According to the traditional account, the United States used nuclear weapons to quickly conclude the war in the Pacific and save the lives of many American GIs (and Japanese soldiers and civilians) that would have been lost if Washington had pursued the alternative route of a ground invasion of the Japanese islands. According to a more recent revisionist view, the nuclear weapons were not in fact necessary to force a Japanese surrender because Tokyo was nearly ready to capitulate and the Soviet Union's impending entrance into the Pacific War would have been more than enough to force Japan to concede defeat.<sup>5</sup> Rather, according to this perspective, Truman's use of nuclear weapons was aimed not at Tokyo, but at Moscow. By using nuclear weapons, Truman was able to end the war quickly enough to prevent Soviet forces from occupying large portions of East Asia and to demonstrate America's awesome new military capability to its future Cold War rival.

Our purpose here is not to adjudicate between these interpretations, nor to improve upon the existing debate, but rather to ask what this historical event might tell us about future nuclear use. If Truman were motivated to quickly end a costly conventional war as the traditional account would have us believe, then there is reason to suspect that such processes could re-occur. Desperate times call for desperate measures and it is conceivable that a nuclear-armed state could be tempted to use nuclear weapons in a future attempt to staunch the bloodletting from a drawn-out conventional conflict. Indeed, as we will see below, some states in the world today actively plan to use nuclear weapons early in warfare as a way to offset

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4. For a summary of the differing narratives surrounding this decision, see Barton J. Bernstein, "Truman and the A-Bomb: Targeting Noncombatants, Using the Bomb, and His Defending the 'Decision,'" *The Journal of Military History* 62, No. 3 (July 1998): 547-570.

5. Gar Alperovitz, *Atomic Diplomacy: Hiroshima and Potsdam* (New York: Simon and Schuster, 1965) is one of the most well-known books to make this controversial claim.

the conventional superiority of potential adversaries.

It is also possible that states might use nuclear weapons in the future in order to demonstrate their capabilities to potential adversaries. If Hiroshima and Nagasaki were primarily about revealing a revolutionary new military capability, then this case is less instructive as no adversary is likely to need that message again. After all, Hiroshima and Nagasaki and the hundreds of nuclear tests that followed provided sufficient proof of concept. In this way the first nuclear use may have been idiosyncratic because it was the first.

If, however, Hiroshima and Nagasaki can be interpreted as a warning shot to a potential future enemy about possessing both the ability and the will to go nuclear, then it may be more relevant. It is possible that future decisions to use nuclear weapons could include a consideration of secondary and tertiary effects, such as demonstrating resolve to other states or deterring or otherwise precluding other parties from intervening in an ongoing conflict.

One must be cautious, however, about extrapolating from a single data point and this single episode, no matter how important, cannot be the only input into our study on the future of nuclear use. To broaden our perspective, therefore, we next turn to theory.

### *Theories of Nuclear Use*

International relations scholars and nuclear deterrence theorists have identified several possible processes by which nuclear war could occur. The most prominent of these scenarios are reviewed here, including: irrational nuclear use, accidental nuclear use, inadvertent nuclear use, catalytic nuclear war, nuclear use against non-nuclear opponents, splendid first strike, use 'em or lose 'em, brinkmanship, and limited nuclear use.

### Irrational Nuclear Use

The first potential cause of nuclear use is irrationality. In practice, irrational nuclear use means a leader using nuclear weapons in pursuit of goals that are so vastly different from our own as to be utterly unrecognizable. Political scientists tend to assume that states are unified rational actors that value their continued existence above all else, but this is a simplifying assumption, not a description of the world in which we actually live.<sup>6</sup> Historically, there have been rare leaders who have been willing to destroy their own states in the pursuit of broader ideological goals, including Adolf Hitler in World War II.<sup>7</sup> One could similarly imagine a leader of a nuclear-armed state on the losing end of a major war, deciding that he has nothing left to lose and voluntarily choosing to unleash the destructive force of nuclear weapons. For example, if the North Korean regime were to collapse, might North Korean supreme leader Kim Jong-Un decide to use nuclear weapons, figuring that if he is going down he might as well take everyone else with him?

Alternatively, it is at least conceivable that somewhere someday a leader could ascend to power with religious, nationalist, racist, or some other extremist worldview that causes him to value nuclear destruction over self-preservation. Iran's clerical establishment, for example, contains a minority of individuals who genuinely appear to hold millenarian religious beliefs.<sup>8</sup> If Iran acquires nuclear weapons and one of these leaders comes to have his finger on

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6. Kenneth N. Waltz, "Reflections on Theory of International Politics: a response to my critics," in *Neorealism and its Critics*, Robert O. Keohane, ed. (New York: Columbia University Press, 1986), 330–331.

7. David F. Lindenfeld, "The Prevalence of Irrational Thinking in the Third Reich: Notes toward the Reconstruction of Modern Value Rationality," *Central European History* 30, No. 3 (1997): 365–385.

8. See for example Jeffrey Herf's "Taking Iran's Anti-Semitism Seriously," *The National Interest*, June 2, 2014 or Mehdi Khalaji's "Apocalyptic Politics: On the Rationality of Iranian Policy," *Policy Focus*, 79 (Washington, DC: The Washington Institute, January 2008).

the nuclear trigger, it is at least imaginable that he might try to launch an unprovoked nuclear attack in an attempt to bring about an apocalypse. Granted, this type of nuclear use may be the most farfetched of those discussed in this chapter, but many international events, including the terrorist attacks of 9/11 and the recent global financial crisis, were virtually unimaginable until they happened.

### Accidental Nuclear Use

A second type of potential nuclear use can be characterized as accidental or unintentional. In 1982 the U.S. Department of Defense (DoD) catalogued all previously known nuclear accidents from 1950 to the 1980s.<sup>9</sup> The list included the 1982 Titan II crisis in which a dropped wrench socket in a nuclear missile silo nearly caused a nuclear explosion, and a number of cases in which aircraft carrying nuclear weapons crashed or dropped nuclear weapons into the ocean but that fortunately failed to detonate.<sup>10</sup>

Scott Sagan, in his book, *The Limits of Safety*, catalogs a number of near nuclear accidents during the Cold War period, including a 1966 midair collision between a B-52 bomber and a KC-135 tanker that led to the release of four hydrogen bombs near Palomares, Spain.<sup>11</sup> In 1968, a B-52 bomber on airborne alert caught fire over Greenland near a U.S. early warning site, causing four one-megaton thermonuclear bombs to hurtle toward the ground.<sup>12</sup> The current era is not immune from nuclear accidents, including the 2007

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9. Department of Defense, "Narrative Summaries of Accidents Involving U.S. Nuclear Weapons, 1950-1980," April 1981, available from [nsarchive.files.wordpress.com/2010/04/635.pdf](http://nsarchive.files.wordpress.com/2010/04/635.pdf).

10. Eric Schlosser, *Command and Control: Nuclear Weapons, the Damascus Accident, and the Illusion of Safety* (New York: The Penguin Press, 2013).

11. Scott Sagan, *The Limits of Safety*, Princeton (NJ: Princeton University Press, 1993), 178.

12. Ibid.

incident in which nuclear weapons were accidentally and unknowingly transported from Minot Air Force Base in North Dakota to Barksdale Air Force Base in Louisiana.<sup>13</sup> Other nuclear weapons states have also had their share of incidents<sup>14</sup> and newer nuclear weapons states may be even more prone to accidents, especially as they strive to develop stable command and control structures.<sup>15</sup> In none of these cases did the nuclear warhead detonate, but we might not be so lucky next time.

### Inadvertent Nuclear Use

An inadvertent nuclear use would occur if a nuclear-capable state decides to launch a nuclear war under the incorrect belief that it is already under nuclear attack.<sup>16</sup> Perhaps the most sophisticated theoretical discussion of inadvertent war is provided by Thomas Schelling in his discussion of “reciprocal fear of surprise attack.”<sup>17</sup> Schelling argues that when two nuclear adversaries face each other in crisis, each side may rightly worry that the other side is considering nuclear attack. If there is an advantage to striking first, then, in these difficult circumstances under intense time pressures, a cycle of fear could lead to nuclear war. As Schelling writes, “Fear that

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13. “Flight of Nuclear Warheads Over U.S. Is Under Inquiry,” *New York Times*, September 6, 2007.

14. On British nuclear weapons accidents, see Eric Schlosser, “Nuclear weapons: an accident waiting to happen,” *Guardian* (Manchester), September 13, 2013.

15. Peter D. Feaver, “Command and Control in Emerging Nuclear Nations,” *International Security* 17, No. 3 (Winter 1992-93): 160-187.

16. In his book, *The Logic of Accidental Nuclear War* (Washington, DC: Brookings Institution Press, 1993), Bruce G. Blair discusses a number of ways in which accidental nuclear war could be launched in the post-Cold War era due to risks in the U.S. and Russian command and control systems.

17. Thomas Schelling, *The Strategy of Conflict* (Cambridge, MA: Harvard University Press, 1960), 207.

the other may be about to strike in the mistaken belief that we are about to strike gives us a motive for striking, and so justifies the other's motive."<sup>18</sup>

In *The Limits of Safety*, Sagan provides several examples of near-inadvertent nuclear war during the Cuban Missile Crisis. In one episode, an intruder—later identified as a bear—led to the sounding of a “sabotage alarm,” which set off similar alarms at all the bases in the area. At one base, an incorrectly wired alarm sent pilots of nuclear-armed fighter aircraft to prepare for takeoff before a car raced down the runway to stop them.<sup>19</sup> Also during the crisis, Vandenberg Air Force Base conducted a regularly scheduled ballistic missile test that the Soviet Union might have reasonably misread as a nuclear missile launch.<sup>20</sup> Finally, at the end of the crisis, Moorestown, New Jersey radar operators alerted NORAD that an incoming missile attack was underway when a training tape simulating an attack was mistakenly run in their system.<sup>21</sup>

Inadvertent nuclear war nearly occurred again in the 1983 ABLE ARCHER incident, in which a very realistic North Atlantic Treaty Organization (NATO) military exercise during a period of tension led the Soviets to worry the training operation was a cover for war preparations. The Soviets put their own nuclear forces on alert in response.<sup>22</sup> A similar scare occurred in the post-Cold War era in January 1995 when a U.S.-Norwegian weather balloon was launched from Norway to study the Aurora Borealis. A Russian early warning radar detected this object, leading Russian President Boris Yeltsin to activate his “nuclear keys” for the first time.

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18. *Ibid.*, 207.

19. Sagan, *The Limits of Safety*, 98-100.

20. *Ibid.*, 78-80.

21. *Ibid.*, 130-131.

22. For declassified documents on the ABLE ARCHER Exercise, see National Security Archive “The Able Archer 83 Sourcebook,” November 7, 2013, available from [www2.gwu.edu/~nsarchiv/nukevault/ablearcher/](http://www2.gwu.edu/~nsarchiv/nukevault/ablearcher/).

Eventually radars detected that the balloon was going out to sea and Russian forces stood down.<sup>23</sup> Given the frequency with which countries have feared themselves to be under nuclear attack in the past, it will likely continue to happen in the future, and it is always possible that at least one of them could lead to a nuclear response.

### Catalytic Nuclear War

During the early Cold War, strategists theorized about the possibility of “catalytic nuclear war.” They imagined that the United States could be attacked with nuclear weapons, and that U.S. leaders would assume, quite reasonably, that the Soviet Union had been responsible for the attack and decide to strike back. Both states would have been vastly weakened after absorbing the nuclear exchange, but what if it had not been the Soviets, but the Chinese who had initially attacked the United States? In the aftermath, the Chinese could emerge as the preeminent power. One party initiates the attack, but the attack is attributed to another party and the secret attacking state comes out of the conflict more powerful than the two victim-states.<sup>24</sup> Given today’s more advanced intelligence, surveillance, and reconnaissance capabilities, a secret attack scenario may seem less plausible, but it is at least imaginable that a third party could begin a crisis that would bring other states to nuclear conflict.

### Nuclear Use Against a Non-nuclear Opponent

In an ongoing crisis or conflict with a non-nuclear state, a nuclear-capable state may be tempted to use nuclear weapons. Nuclear use could be attractive in this situation because there would be no dan-

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23. David Hoffman, “Cold-War Doctrines Refuse to Die,” *Washington Post*, March 15, 1998, A01.

24. Donald H. Kobe, “A Theory of Catalytic War,” *The Journal of Conflict Resolution* 6, No. 2 (June 1962): 125-142.

ger of nuclear retaliation from the targeted state, although such use could have other ill effects, including international opprobrium.

The only case of nuclear use, against Japan during World War II, illustrates this type of use. Nuclear attacks against non-nuclear states have also been considered on at least a few other occasions. Reportedly, the French briefly contemplated nuclear use against the Vietnamese in the 1954 Battle of Dien Bien Phu during the First Indochina War.<sup>25</sup> Almost two decades later in the same country, U.S. President Richard Nixon mentioned the possibility of using a nuclear weapon to U.S. National Security Advisor Henry Kissinger, saying, “I’d rather use the nuclear bomb.” Kissinger responded that nuclear use would be “too much” to which Nixon responded, “The nuclear bomb. Does that bother you?” He went on to say, “I just want you to think big.”<sup>26</sup>

Thus far leaders from nuclear-capable states have appeared to agree with Kissinger that nuclear use against non-nuclear weapons states is “too much.” But two points are important to note. First, the conflicts in which nuclear states have forgone nuclear use against non-nuclear states—in addition to the above conflicts, one could add China in the Korean War, the Falklands War, and the first and second Gulf Wars—were not existential threats to the nuclear states. In future conflicts with greater stakes, nuclear weapons states may be more likely to consider nuclear use. Second, there is also the possibility of nuclear use against a non-nuclear state brandishing chemical and biological weapons. The unique physical and psychological damage caused by these unconventional weapons have caused leaders to consider nuclear weapons as a potentially appropriate response and a stronger means of deterrence than conven-

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25. John Newhouse, *War and Peace in the Nuclear Age* (New York: Alfred A. Knopf, 1988), 99-101; and Martin Windrow, *The Last Valley: Dien Bien Phu and the French Defeat in Vietnam* (Cambridge, MA: Da Capo Press, 2004).

26. “Nixon Proposed Using A-Bomb in Vietnam War,” *New York Times*, March 1, 2002, available from [www.nytimes.com/2002/03/01/world/nixon-proposed-using-a-bomb-in-vietnam-war.html](http://www.nytimes.com/2002/03/01/world/nixon-proposed-using-a-bomb-in-vietnam-war.html).

tional threats. During the 1991 Gulf War, the administration of U.S. President George H.W. Bush attempted to threaten nuclear use to deter Iraqi President Saddam Hussein from using chemical weapons against U.S. soldiers.<sup>27</sup> Similarly, during the 2003 Iraq War, officials from the George W. Bush administration again made veiled threats of nuclear use by claiming no options were off the table to deter Iraqi use of chemical and biological weapons (CBW).<sup>28</sup> Bush administration officials later said they would not have used nuclear weapons, but they must have thought use was credible enough to issue the threat.

Today U.S. nuclear doctrine continues to leave open the possibility of nuclear use in response to unconventional attacks. The 2010 Nuclear Posture Review (NPR) states, “there remains a narrow range of contingencies in which U.S. nuclear weapons may still play a role in deterring a conventional or CBW attack against the United States or its allies and partners.”<sup>29</sup> Similarly, the 2010 Russian nuclear doctrine reserves the option “to utilize nuclear weapons in response to the utilization of nuclear and other types of weapons of mass destruction against it and (or) its allies.”<sup>30</sup>

Finally, there are those who argue that nuclear weapons should be considered in cases of cyber-attack. In January 2013, DoD’s Defense Science Board issued a report arguing the United States should be prepared to use nuclear weapons in response to major

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27. Scott D. Sagan, “Realist Perspectives on Ethical Norms and Weapons of Mass Destruction,” in Sohail H. Hashmi and Steven P. Lee, eds., *Ethics and Weapons of Mass Destruction* (Cambridge: Cambridge University Press, 2004), 81.

28. Wade Boese, “U.S. Issued Warning on Threat of Possible Iraqi WMD Use,” *Arms Control Today* 33, No. 4 (May 2003).

29. Department of Defense, *Nuclear Posture Review Report* (Washington, DC: April 2010), viii.

30. “The Military Doctrine of the Russian Federation” approved by Russian Federation presidential edict on February 5, 2010, translated text available from [carnegieendowment.org/files/2010russia\\_military\\_doctrine.pdf](http://carnegieendowment.org/files/2010russia_military_doctrine.pdf).

cyber-attacks and Washington has not yet ruled out any such use in official doctrine.<sup>31</sup>

### Splendid First Strike

A sixth potential use of nuclear weapons is the so-called “splendid first strike.” The purpose of this type of nuclear use is to destroy all of an adversary’s nuclear weapons in a single nuclear campaign, leaving the adversary unable to strike back with nuclear weapons.

No state has ever attempted a nuclear first strike, but such strikes have been considered. In the early Cold War it was plausible for the United States, with its head start in the nuclear arms race, to consider a splendid first strike against the Soviet Union. In April 1950, the U.S. National Security Council rejected preventive war on the nascent Soviet arsenal “on strategic and moral grounds.”<sup>32</sup> Although the decision document, NSC-68, did allow for a pre-emptive strike if the United States were under imminent attack from the Soviet Union.<sup>33</sup> During the administration of U.S. President Dwight Eisenhower, military planners explored a preventive war option, with a Joint Chiefs of Staff Advance Study Group recommending the United States consider starting a war with the Soviets before their nuclear forces became “a real menace.”<sup>34</sup> Other military leaders disagreed, in effect calling such an attack un-American, and this option was ruled out by December 1954.<sup>35</sup> Both the United States

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31. Defense Science Board, *Resilient Military Systems and the Advanced Cyber Threat* (Washington, DC: U.S. Department of Defense, January 2013), available from [www.acq.osd.mil/dsb/reports/ResilientMilitarySystems.CyberThreat.pdf](http://www.acq.osd.mil/dsb/reports/ResilientMilitarySystems.CyberThreat.pdf).

32. Scott D. Sagan, *Moving Targets: Nuclear Strategy and National Security* (Princeton, NJ: Princeton University Press, 1989), 19-20.

33. Quoted in *Ibid*, 20.

34. Quoted in *Ibid*, 21.

35. *Ibid*, 21-22.

and the Soviets considered a nuclear first strike against China in the 1960s.<sup>36</sup>

As the Soviet Union's nuclear arsenal developed over time, Washington began to worry that its nuclear forces might themselves be vulnerable to a splendid first strike. RAND Corporation analyst Albert Wohlstetter argued that the balance of terror might be more "delicate" than previously believed and, as a result, the U.S. military dispersed its air bases and took other measures to ensure nuclear survivability.<sup>37</sup>

Carrying out a nuclear first strike would entail great risk. If the strike failed to destroy every single nuclear weapon of the adversary, then the attacker would risk devastating nuclear retaliation in response. Even Herman Kahn, author of *On Thermonuclear War*, argued that "for...practical reasons alone, not to speak of vitally important moral and political ones, the notion of having a Splendid First Strike Capability seems fanciful."<sup>38</sup> This type of nuclear use would be most plausible, therefore, against a target state that possessed relatively few weapons at known locations.

Though there are no historical examples of a splendid first strike using nuclear weapons, the strategic logic underpinning this type

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36. On Soviet interest in attacking Chinese nuclear facilities see, U.S. State Department Memorandum of Conversation, "US Reaction to Soviet Destruction of CPR [Chinese Peoples Republic] Nuclear Capability; Significance of Latest Sino-Soviet Border Clash, ...," August 18, 1969, Secret/Sensitive, National Archives, SN 67-69, Def 12 Chicom, available from [www2.gwu.edu/~nsarchiv/NSAEBB/NSAEBB49/sino.sov.10.pdf](http://www2.gwu.edu/~nsarchiv/NSAEBB/NSAEBB49/sino.sov.10.pdf). On U.S. considerations see William Burr and Jeffrey T. Richelson, "Whether to 'Strangle the Baby in the Cradle:' The United States and the Chinese Nuclear Program, 1960-64," *International Security* 25, No. 3 (Winter 2000-01): 54-99.

37. Albert Wohlstetter, "The Delicate Balance of Terror," RAND Report P-1472, November 6, 1958. Available from [www.rand.org/about/history/wohlstetter/P1472/P1472.html](http://www.rand.org/about/history/wohlstetter/P1472/P1472.html).

38. Herman Kahn, *On Thermonuclear War* (Princeton NJ: Princeton University Press, 1960), 37.

of attack, to wipe out an adversary's nuclear capability in one strike to prevent one's own state from being targeted in the future, has been pursued by states using conventional weapons. In destroying Iraq's Osirak nuclear reactor in 1981, for example, Israel attempted to take out Iraq's developing nuclear capability, striking before it had a more developed weapons program. Israel took similar action when bombing the Syrian al-Kibar reactor in September 2007. If a country were further along in a nuclear weapons program and conventional weapons were insufficient to destroy an enemy nuclear program, it is conceivable that leaders would consider nuclear weapons appropriate for the task for the same underlying reasons.

### Use 'Em or Lose 'Em

In a crisis situation involving two nuclear-armed states, each may fear their nuclear weapons will be vulnerable to attack by their adversary and thus decide to use them before they are wiped out. Pressure to "use 'em or lose 'em" in a crisis might be heightened if a country possesses a nuclear arsenal that is vulnerable to a splendid first strike or if the adversary's nuclear posture favors the offense. For example, during the Cold War, each side maintained ballistic missiles with relatively accurate multiple independently targetable reentry vehicles (MIRVs). With this capability, a single missile could target and destroy a number of the adversary's nuclear weapons. Even if all of the targeted state's missiles were not destroyed, it would be left at great numerical disadvantage vis-à-vis the attacking state. This condition meant each side felt immense pressure to launch its missiles first in the event of conflict, leading to the development of "launch on warning" postures in which weapons already on alert could be quickly deployed if an incoming attack were detected. In this situation, it might be more reasonable for a leader to simply back down rather than initiate a nuclear war from such a disadvantaged position, but it is possible that a future leader would prefer to use them than lose them.

## Nuclear Brinksmanship

Many scholars and practitioners incorrectly believe that nuclear use is impossible, or at the very least irrational, once one's adversary possesses a secure second-strike capability. If an adversary has the ability to absorb a nuclear attack and respond with a devastating counterattack, then one can no longer hope to conduct a splendid first strike and any nuclear use could result in unacceptable retaliation. Meanwhile, states would not feel the same use 'em or lose 'em pressures, because they would understand that they could ride out a nuclear attack and still hit back with force. Since both sides understand these facts, a situation of restraint arises due to the condition of Mutually Assured Destruction (MAD). Yet, nuclear deterrence theorists have identified several rational uses of nuclear weapons even in a condition of MAD.

Thomas Schelling was the first to devise a rational means by which states can threaten nuclear-armed opponents.<sup>39</sup> He argued that leaders cannot credibly threaten to intentionally launch a suicidal nuclear war, but they can make a "threat that leaves something to chance."<sup>40</sup> They can engage in a process, a nuclear crisis, which increases the risk of nuclear war in an attempt to force a less resolved adversary to back down. As states escalate a nuclear crisis there is an increasing probability that the conflict will spiral out of control and result in an inadvertent or accidental nuclear exchange. As long as the benefit of winning the crisis is greater than the incremental increase in the risk of nuclear war, threats to escalate nuclear crises are inherently credible. In these games of nuclear brinkmanship, the state that is willing to run the greatest risk of nuclear war before backing down will win the crisis as long as it does not end in catastrophe. It is for this reason that Schelling called great power

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39. Thomas Schelling, *The Strategy of Conflict* (Cambridge, MA: Harvard University Press, 1960).

40. *Ibid.*, 127.

politics in the nuclear era a “competition in risk taking.”<sup>41</sup>

This does not mean that states eagerly bid up the risk of nuclear war. Rather, they face gut-wrenching decisions at each stage of the crisis. They can quit the crisis to avoid nuclear war, but only by ceding an important geopolitical issue to an opponent. Or they can escalate the crisis in an attempt to prevail, but only at the risk of suffering a possible nuclear exchange.

On brinksmanship, U.S. Secretary of States John Foster Dulles stated, “The ability to get to the verge without getting into the war is the necessary art... If you try to run away from it, if you are scared to go to the brink, you are lost.”<sup>42</sup> The bipolar Cold War conflict provides several examples of nuclear brinksmanship, with the Cuban Missile Crisis as the most notable. Soviet Premier Nikita Khrushchev initially raised the stakes by placing nuclear weapons in Cuba, gravely threatening the U.S. homeland and meddling within the U.S. sphere of influence. In response, U.S. President John F. Kennedy escalated by placing a blockade around the island so Soviet ships could not deliver additional missiles. In the end, the Soviet Union withdrew its missiles from Cuba, but not before the risk of nuclear war was raised to, in President Kennedy’s mind, “between 1 in 3 and even.”<sup>43</sup>

Other historical examples of brinkmanship include Moscow’s threats against the British and the French during the 1956 Suez Crisis, Moscow’s threats to attack China during the Sino-Soviet border war in 1969, President Nixon’s nuclear alerts in 1969 and 1973, and finally, Indian and Pakistani threats and nuclear weapons

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41. Thomas Schelling, *Arms and Influence* (New Haven, CT: Yale University Press, 1966), 91.

42. John Lamberton Harper, *The Cold War* (Oxford: Oxford University Press, 2011), 117-118.

43. Quoted in Graham Allison, “The Cuban Missile Crisis at 50: Lessons for U.S. Foreign Policy Today,” *Foreign Affairs* 91, No. 4 (July/August 2012): 11-16.

movements during the 1999 Kargil Crisis.<sup>44</sup> Looking to the future, as long as rivalries continue and as long as leaders are willing to initiate and escalate high stakes crises in search of their geopolitical goals, the risk of war through nuclear brinkmanship will remain with us.

### Limited Nuclear War

During the course of the Cold War nuclear strategists considered an alternative to all-out nuclear war between the two superpowers: limited nuclear war.<sup>45</sup> This is conflict “in which each side exercises restraint in the use of nuclear weapons, employing only a limited number of weapons on selected targets.”<sup>46</sup> By launching a single nuclear weapon against a small city or an isolated military base, for example, a nuclear-armed state could signal its willingness to escalate a crisis, while leaving its adversary with enough left to lose to deter the adversary from launching a full-scale nuclear response. U.S. proponents of limited nuclear war included Henry Kissinger and Robert Osgood.<sup>47</sup> In his 1957 book *Nuclear Weapons and Foreign Policy*, Kissinger argued that the United States should be prepared for alternatives to “all-out” nuclear war, especially in peripheral conflicts.<sup>48</sup> Limited nuclear war, he argues, cannot be “improvised” during the course of conflict, but it has “its own appro-

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44. Kroenig, “Nuclear Superiority and the Balance of Resolve,” (2013): 141-171.

45. Klaus Knorr, *Limited Strategic War* (New York: Praeger, 1962).

46. Jeff A. Larsen, and James M. Smith, *Historical Dictionary of Arms Control and Disarmament* (Lanham, MD: Scarecrow Press, 2005), 128.

47. Morton H. Halperin provides a helpful summary of the debate over limited nuclear in the 1950s in “Nuclear Weapons and Limited War,” *The Journal of Conflict Resolution* 5, No. 2 (June 1961): 146-166.

48. Henry A. Kissinger, *Nuclear Weapons and Foreign Policy* (New York, NY: Council on Foreign Relations, 1957): 177.

ropriate tactics...with limitations as to targets, areas and the size of weapons used.”<sup>49</sup> Most importantly, limited nuclear war requires communicating to adversaries in advance the understandings of limited war, otherwise “miscalculations and misinterpretations” of intentions “may cause the war to become all-out even if both sides intend to limit it.”<sup>50</sup>

In the current era there are a number of conflicts in which adversaries could engage in limited nuclear war. Because arsenal sizes vary, the defining feature of this type of nuclear war is not that it seeks to avoid all-out nuclear exchange, but that nuclear weapons are employed with some level of restraint, to avoid the widespread use of nuclear weapons on both sides.

History provides examples of states planning to deploy nuclear weapons in a limited way to achieve limited aims. During the early Cold War when the United States was conventionally inferior to the Soviet Union, U.S. leaders felt they had no choice but to go nuclear to stop Soviets from overrunning Europe. This is similar to France’s approach to nuclear strategy during the Cold War. Vastly overmatched by Moscow, the French plan was also to resort to launching nuclear weapons as soon as conventional fighting began.<sup>51</sup> Similarly, at present, America’s conventionally inferior adversaries have incentives to use nuclear weapons early in a crisis in an attempt to deter further escalation and ensure their own survival.<sup>52</sup>

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49. Ibid, 185.

50. Ibid.

51. For a thorough discussion of the development of French nuclear strategy, see Bruno Tertais, “Destruction Assuree: The Origins and Development of French Nuclear Strategy, 1945-1982,” in Henry D. Sokolski ed., *Getting MAD: Nuclear Mutual Assured Destruction, Its Origins and Practice* (Carlisle, PA: Strategic Studies Institute, 2004), 64.

52. Keir A. Lieber and Daryl G. Press, “The Nukes We Need,” *Foreign Affairs* 88, No. 6 (November/December 2009): 42.

### *Identifying the Next Nuclear War*

Having reviewed the various pathways that could produce nuclear war in theory, we turn to the empirics to examine the countries with the capabilities and political conflicts that could conceivably produce the next nuclear war. Nine states currently possess nuclear weapons, and a tenth, Iran, appears to be seeking at least a latent nuclear capability. Although nuclear use by any one state appears unlikely, there are a number of potential conflicts involving nuclear-armed states that could lead to nuclear use. In addition to states, a handful of terrorist organizations have expressed desire to employ nuclear weapons. The following section examines the nuclear capabilities and doctrines of these actors and the geopolitical conflicts that could escalate into nuclear use in the future. Indeed, certain trends in nuclear force modernization, doctrine, and regional enmities suggest nuclear use may have become more, not less, likely in recent years.

### Russia, the United States, and NATO

Under the New Strategic Arms Reduction Treaty (New START), the United States and Russia agreed to limit their arsenals to 1,550 deployed nuclear warheads and 800 total delivery platforms by 2018. The United States maintains a nuclear triad, with nuclear warheads delivered by intercontinental ballistic missiles (ICBMs), submarine launched ballistic missiles (SLBMs), and bomber aircraft, and is in the early planning stages for modernizing each of these platforms. In the 2010 Nuclear Posture Review, Washington vowed not to use or threaten to use nuclear weapons against non-nuclear states in good standing with the Nuclear Nonproliferation Treaty (NPT) and their nonproliferation commitments.<sup>53</sup> For states not covered by this negative security assurance, U.S. leaders may consider nuclear weapons for deterring nuclear, conventional, biological, or even cyber-attacks. The report concludes that the United

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53. *Nuclear Posture Review Report*, 15.

States “would only consider the use of nuclear weapons in extreme circumstances to defend the vital interests of the United States or its allies and partners.”<sup>54</sup>

Russia also maintains a nuclear triad, including ICBMs (some of which are road-mobile), SLBMs, and bombers and it is modernizing all of its delivery systems. Russia is in the process of equipping more of its ICBMs with MIRVs, a move that many consider destabilizing, especially in relation to the de-MIRVed U.S. ICBM force.<sup>55</sup> In addition, Russia is working on new ICBMs, including a heavy ICBM with as many as ten warheads to replace the retiring SS-18.<sup>56</sup> Russia is reportedly developing a new rail-mobile system, the “Barguzin” that will allow it to very quickly move nuclear weapons around its vast territory.<sup>57</sup> Russia is also developing a new stealth, long-range bomber with production to begin in 2020. Moscow is also modernizing the sea leg with plans for eight new Borei-class submarines armed with 16 Bulava missiles, containing six warheads each.<sup>58</sup> In addition to the strategic force, Russia is estimated to maintain between 1,000 and 6,000 tactical or nonstrategic weapons in its arsenal.<sup>59</sup>

Unlike the United States, which has sought to reduce its reliance on nuclear weapons since the end of the Cold War, Russia has developed a greater role for these weapons in the past decade. This change has stemmed primarily from an imbalance in conventional

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54. *Ibid.*, 17.

55. Hans M. Kristensen and Robert S. Norris, “Russian Nuclear Forces 2014,” *Bulletin of the Atomic Scientists*, Vol. 70, No. 2, March/April 2014, pp. 75-85.

56. *Ibid.*, 78.

57. Ben Hoyle, “Russia’s Cold War nuclear missile train back on track in new arms race,” *The Australian*, December 2, 2014.

58. *Ibid.*, 79.

59. Amy F. Woolf, “Nonstrategic Nuclear Weapons,” RL32572, (Washington, DC: Congressional Research Service, January 3, 2014).

capabilities vis-à-vis the United States. In the post-Cold War period, Russia's conventional forces have been vastly inferior to Western capabilities and they lowered their doctrinal threshold for nuclear use in an attempt to offset this weakness. In the 1990s, Russia stated that the sole purpose of nuclear weapons was deterrence of large-scale attacks that threaten the state existentially, but by 2000, Russia reserved "the right to use nuclear weapons in response to the use of nuclear and other types of weapons of mass destruction against it and (or) its allies, as well as in response to large-scale aggression utilizing conventional weapons in situations critical to the national security of the Russian Federation."<sup>60</sup> The 2010 doctrine moderated this statement somewhat, but it is clear that nuclear weapons remain central to Russian strategy as military thinkers in Russia argue that in the course of a large conventional conflict nuclear weapons could be utilized as means of "de-escalation." Moreover, since 1999, nuclear weapons have featured prominently in Russian military exercises and in March 2014, Russia performed a large-scale nuclear exercise that was presided over by Russian President Vladimir Putin himself.<sup>61</sup> Russian leaders engaged in outright nuclear saber-rattling over the crisis in Ukraine, beginning in 2014 and even threatened Denmark that it would become a target of Russian nuclear missiles if it hosted part of NATO's missile defense system.<sup>62</sup>

As the successor state of the Soviet Union, Russia has a long history of conflict with the United States and the countries of the North

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60. "Военная Доктрина Российской Федерации" (Russia's Military Doctrine), Утверждена Указом Президента Российской Федерации от 21 апреля 2000 г. N 706 (Approved by Presidential Decree on 21 April, 2000 N. 706), available from [www.rg.ru/official/doc/ykazi/doc\\_war.htm](http://www.rg.ru/official/doc/ykazi/doc_war.htm). An English translation of the doctrine is available from [www.armscontrol.org/act/2000\\_05/dc3ma00](http://www.armscontrol.org/act/2000_05/dc3ma00).

61. Ibid., x.; Zachary Keck, "Russia's Military Begins Massive Nuclear War Drill," *The Diplomat*, March 29, 2014; and "U.S. Conducts Nuclear Response Exercises," *Global Security Newswire*, May 12, 2014.

62. David M. Herszenhorn, "Russian Warns Denmark on Joining NATO Missile Defense," *The New York Times*, March 22, 2015.

Atlantic Treaty Organization (NATO). For forty years these two powers teetered on the brink of nuclear war, especially during periods of high tension, including the Korean War, the 1956 Suez Crisis, the 1961 Berlin Crisis, and the 1962 Cuban Missile Crisis. Though the ideological struggle between the United States and the Soviet Union ended with the dissolution of the Soviet Union in 1991, tensions between these two states remain. Nationalism has grown in recent years with Russian strongman Vladimir Putin declaring in 2005 that the dissolution of the Soviet Union was the “greatest geopolitical catastrophe” of the twentieth century.<sup>63</sup> As of this writing, reports indicate Russia maintains thousands of troops inside eastern Ukraine, with thousands more on the border. NATO is planning a number of military exercises with allies on the Russian periphery including a March 2015 exercise in the Black Sea with Romania and upcoming military drills with Bulgaria.<sup>64</sup>

Indeed, the most likely flashpoint for U.S./NATO and Russian conflict today is in Russia’s periphery. In 2008, Russia invaded its neighbor Georgia and the current crisis over Ukraine highlights the persistent tension between Russia and the West over NATO expansion and what Russia perceives as encroachment in its traditional sphere of influence. In addition to Georgia and Ukraine, one can imagine future conflict between Russia and NATO members such as Estonia, Latvia, Lithuania, and Poland, where Russia retains historical and cultural interest and may find reason for interference. If Russia were to use force against a NATO country, Washington would be obligated by the NATO charter to come to its ally’s defense. And a Russian and NATO conflict in Europe would take place under the shadow of nuclear war.

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63. Andrew Osborn, “Putin: Collapse of the Soviet Union was ‘catastrophe of the century,’” *The Independent* (London), April 26, 2005.

64. See, for example, “6 ships arrive in Black Sea to take part in NATO exercises,” *The Associated Press*, March 13, 2015; and “Bulgaria, United States to begin military drills amid Ukraine Crisis,” *Reuters*, March 13, 2015.

## China and the United States

Chinese military capabilities, including its nuclear arsenal, are smaller and less effective than those of the United States, but China is in the midst of a three-decade process of translating its economic prowess into vast military power. By some calculations its military budget is now almost \$200 billion, second only to the United States.<sup>65</sup> The Chinese have traditionally been comfortable with a nuclear posture that has been described as a minimal deterrent, but the People's Liberation Army's (PLA) 2005 Science of Military Strategy planning calls for the development of a "lean and effective" arsenal, with many Western analysts noting that the emphasis is on the "effective."<sup>66</sup> Current estimates indicate China has approximately 250 warheads in its stockpile and this number is expected to expand.<sup>67</sup> Approximately 60 of these weapons are on missiles capable of reaching the continental United States.<sup>68</sup> The 2013 DoD report to Congress on Chinese military capabilities recounts continued Chinese investments in ballistic missiles, cruise missiles, counter-space weapons, and "military cyberspace capabilities that appear designed to enable anti-access/area-denial (A2/AD) missions."<sup>69</sup> The PLA Rocket Force, in control of Chinese conventional and nuclear ballistic missiles, in recent years has added two types of road-mobile ballistic missiles to its arsenal and one of these modifications can reach most locations in the United States. The DoD report speculates the PLA Rocket Force may be developing a MIRV capability for a new road-mobile ICBM.

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65. Zachary Keck, "China's Defense Budget: A Mixed Bag," *The Diplomat*, March 8, 2014.

66. Peng Guangqian & Yao Youzhi, eds., *Science of Military Strategy* (Beijing: Military Science Publishing House, 2005).

67. Hans M. Kristensen and Robert S. Norris, "Chinese nuclear forces, 2013," *Bulletin of the Atomic Scientists* 69, No. 6 (November/December 2013): 79.

68. *Ibid.*

69. Office of the Secretary of Defense, "Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2013," i.

MIRVs, maneuverable reentry vehicles (MaRVs), anti-satellite capabilities, and penetration aids are all being developed to overcome U.S. ballistic missile defenses.<sup>70</sup> In addition, China has built an “underground great wall,” a 3,000 mile tunnel network in which to house and protect its mobile nuclear missiles. The Chinese Navy is developing a sea-based nuclear deterrent, with three Jin-class submarines in testing and as many as five in development. These submarines will eventually carry SLBMs. The Chinese also have bombers capable of delivering nuclear weapons.

If a crisis in the region were to grow into a larger conflict, what does Chinese nuclear doctrine suggest about its willingness to use nuclear weapons? Since detonating its first nuclear weapon in 1964, China has persistently claimed to follow a “no first use policy,” although its doctrine carves out space for exceptions. For example, the 2005 Science of Military Strategy document declared that China would only use nuclear weapons in response to a strategic attack, but that a strategic attack would not necessarily involve nuclear weapons and could even be political or psychological in nature.<sup>71</sup> Moreover, China’s conventional inferiority when faced with an adversary like the United States may cause its leaders to consider escalation to nuclear weapons in a future conflict short of a “strategic attack,” just like many of the conventionally inferior nuclear-capable states discussed above. For the first time, China’s 2013 White Paper did not explicitly state China’s “no first use policy” leading some to speculate that concern with U.S. conventional capabilities may merit the option of using nuclear weapons first.<sup>72</sup>

In the past, Taiwan has been the assumed flashpoint for potential U.S.-China conflict.<sup>73</sup> The United States maintains a commitment

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70. Ibid, 31.

71. Peng & Yao, eds., *Science of Military Strategy*, 2005.

72. James Acton, “Is China Changing Its Position on Nuclear Weapons?” *New York Times*, April 18, 2013.

73. See for example, Kenneth Lieberthal, “Preventing a War Over Taiwan,”

to support Taiwan through the Taiwan Relations Act of 1979 and has sold Taiwan advanced weaponry. Meanwhile, China's military modernization has focused on regional contingencies, including a Taiwan scenario. The U.S. and China engaged in an intense crisis over the island in 1995 and 1996 when the Chinese government test fired missiles near Taiwan in reaction to political developments on the island and a Taiwanese presidential visit to the United States. U.S. President Bill Clinton responded by sending two carrier battle groups to the South China Sea in a visible show of American military support for Taiwan. Relations between China and Taiwan have improved since 2008, but elections in 2016 brought a more nationalistic government to power in Taiwan and renewed tensions.

More recently, other regional disputes have taken center stage as China's growing power has led it to assert a sphere of influence that overlaps with areas claimed by U.S. allies and partners, as well as seas in which the U.S. Navy has long sailed uncontested. China has ongoing disputes with Japan over the Diaoyu/Senkaku islands in the East China Sea and with Vietnam, Indonesia, Malaysia, and the Philippines over islands in the South China Sea. The geography of the region creates many opportunities for miscalculation. Chinese naval ships pass within sight of Japan when heading to the Pacific Ocean. Fishing and shipping vessels regularly end up in disputed territory. Seemingly small incidents at sea could lead to crisis, which if not managed well, could lead to broader conflict. In May of 2014, Japan reported that two Chinese fighter jets had flown dangerously close to its reconnaissance planes in two separate incidents in airspace both states claim. China appears to be literally testing the waters (and the skies) to illustrate its growing strength in the region, behavior that has high risk of resulting in a clash.

Recent Chinese military exercises also demonstrate that Beijing is preparing for hostilities beyond a Taiwan scenario. In MISSION ACTION 2013, Chinese forces simulated an invasion of the Senkaku islands. After tracking the exercise, the chief of intelligence

of the U.S. Pacific Fleet stated, “[We] concluded that the PLA has been given the new task to be able to conduct a short sharp war to destroy Japanese forces in the East China Sea following with what can only be expected a seizure of the Senkakus or even a southern Ryukyu [islands].”<sup>74</sup> Chinese exercises also demonstrate China’s desire to break out of its geographic confines and become a blue water naval power. In a winter 2013 exercise called MANEUVER 5, Chinese forces successfully fought through the “first island chain” into the Pacific Ocean.<sup>75</sup>

Unlike the U.S.-Soviet relationship, the United States and China do not enjoy a history of interaction that promotes stability. Each side may only be able to learn lessons about the other’s crisis signaling, redlines, and crisis communications only through dangerous experience. For example, the United States and China do not have a Cold War-style hotline set up between their highest leadership to mitigate the risk that misperceptions could lead to war (a line between the DoD and Chinese Defense Ministry has not yet been tested in a period of tension). China is notable for its lack of transparency, especially in the nuclear realm. This position is understandable for a power which maintains fewer nuclear weapons than potential adversaries, but it does mean misunderstandings or miscalculations might be even more likely.

### Russia and China

A final great power dyad in which nuclear war is possible is Russia and China. Both have large and sophisticated nuclear arsenals, although, as described above, Russia maintains a clear nuclear superiority. But China’s conventional and nuclear capabilities are grow-

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74. Sam LaGrone, “Navy Official: China Training for ‘Short Sharp War’ with Japan” *USNI News*, February 18, 2014.

75. Andrew Berglund, “‘Maneuver-5’ Exercise Focuses on Improving Distant Seas Combat Capabilities,” *U.S.-China Economic and Security Review Commission Staff Report*, December 16, 2013.

ing and its two million-member army is of concern to Moscow. The two powers have clashed over their 2,700-mile border throughout the decades and in 1969, during the Sino-Soviet Border War, the Soviet Union issued explicit nuclear threats against China. In the 1990s and 2000s, the countries agreed to officially end the border disputes and there have even been subsequent signs of cooperation. Yet, despite some shared interests due in part to a shared perception of threat from Washington and its allies, Russia is watching China's rise and military modernization warily. Indeed, Moscow is changing its nuclear posture in response to developments in Beijing. Over the past several years, Moscow has been cheating on the 1987 Intermediate Nuclear Forces (INF) Treaty by developing a land-based nuclear missile in the banned 300-3,400 mile range and Russian officials are quite clear that the nuclear forces are a necessary response to Chinese intermediate range nuclear forces. While it is hard to conceive of a direct military struggle between these two powers in the near term, the rise of China will continue to pose an increasing threat to Russia. It is likely that relations between these two great powers will ebb and flow over time, and if and when they worsen to the point of another direct military confrontation, nuclear weapons will be present.

### North Korea, South Korea, Japan, and the United States

Over the past decade, the Democratic People's Republic of Korea (DPRK) has demonstrated its growing nuclear and missile capabilities. It is currently estimated to possess enough fissile material for between thirteen and thirty nuclear warheads.<sup>76</sup> It is unclear, however, whether Pyongyang has yet developed the capability to miniaturize weapons for delivery on missiles. North Korea has developed short and medium-range weapons that can reach South Korea and Japan, but has not yet successfully test launched an in-

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76. David Albright and Christina Walrond, "North Korea's Estimated Stocks of Plutonium and Weapon-Grade Uranium," *Institute for Science and International Security*, August 16, 2012.

tercontinental-range missile.

Relations between Pyongyang and its neighbors are openly hostile. North and South Korea have technically been in an armistice since 1953 when fighting in the Korean War ended. Both states claim the right to the entire peninsula and they have had tense relations since the end of the war that have occasionally included direct military attacks. At present, Japan and North Korea do not maintain official diplomatic relations. They also have a long history of ill-will stemming from the Japanese occupation of Korea in the early part of the twentieth century and the kidnapping of Japanese citizens by North Korea in the 1970s and 1980s.

In recent years, Pyongyang has taken provocative action against both South Korea and Japan, such as shelling South Korea's Yeonpyeong Island in 2010, sinking a South Korean warship in 2010, and test-firing missiles into the Sea of Japan. In January 2014, DPRK leadership threatened nuclear war in the run up to Republic of Korea (ROK)-U.S. military exercises, complaining that these joint exercises are preparation for an invasion of North Korea.<sup>77</sup>

The situation in North Korea is especially volatile because Kim Jung-Un has already demonstrated willingness to take drastic action to solidify his position and remain in power and due to similar domestic pressures he may have incentives to create a crisis in which nuclear use becomes possible.

If North Korea's erratic behavior continues or escalates, there is a potential for the United States to become involved in a conflict based on its treaty commitments to South Korea and Japan. Since they face nuclear adversaries, U.S. reassurance tends to include a heavy emphasis on nuclear capabilities. In the spring of 2013, for example, the U.S. flew two nuclear-capable B-2s over the Peninsula to threaten the North and reassure the South.

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77. "North Korea threatens nuclear war in run-up to US-South Korea war games," *Associated Press*, January 29, 2014.

North Korea does not publicize an official nuclear doctrine, although its rhetoric has been bellicose and has included explicit nuclear threats against the United States and South Korea in the recent past. If Kim Jung Un enters into an open conflict with the vastly superior United States, he may have incentive to use nuclear weapons in an attempt to bring a rapid halt to the conflict and to preserve his life and his regime. With such a small and vulnerable arsenal, Kim might also feel “use ‘em or lose ‘em” pressure, encouraging him to go nuclear early in a conflict. If Pyongyang were to use nuclear weapons, some analysts assume DPRK would employ a countervalue strategy, aiming its weapons at cities in neighboring South Korea or Japan.

If U.S. reassurances prove insufficient, it is always possible that Japan or South Korea could decide to build independent nuclear deterrent forces. Japan has considered and then rejected nuclear weapons three times in the nuclear age and to this day possesses what is essentially a latent nuclear weapons capability. Due to its well-known “nuclear allergy,” nuclear proliferation in Japan seems unlikely in the near-term, but it remains possible. In South Korea, recent polling indicates that two-thirds of citizens support developing nuclear weapons.<sup>78</sup> South Korea has also been actively seeking indigenous reprocessing technology for peaceful purposes, but that could help Seoul develop a weapons capability at some point in the future. If Japan and South Korea join the United States, China, and North Korea as nuclear powers, East Asia would become a poly-nuclear region, rife with geopolitical tensions and rivalries that would be ripe for the next nuclear conflict.

### India and Pakistan

If asked where a nuclear exchange is most likely today, many analysts would select the Indian subcontinent. The longstanding rivalry

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78. Martin Fackler and Choe Sang-Hun, “South Korea Flirts With Nuclear Ideas as North Blusters,” *New York Times*, March 10, 2013.

between these two nuclear-capable states has involved numerous crises. They have an on-going territorial dispute over Kashmir, an active arms race, and the instability generated by a conventionally inferior and revisionist Pakistan armed with nuclear weapons.

The two nuclear powers are currently engaged in a nuclear arms race. Pakistan has the world's fastest growing nuclear arsenal.<sup>79</sup> Currently it is estimated to have 110 weapons, while making enough highly enriched uranium for 10-15 weapons per year.<sup>80</sup> In addition, Pakistan has a growing plutonium production capability, with China agreeing to provide as many as three new reactors.<sup>81</sup> Its delivery vehicles include aircraft and surface-to-surface missiles.<sup>82</sup> Pakistan recently added a maneuverable, short-range, sub-kiloton battlefield nuclear missile to its arsenal, the Hatf IX or Nasr, allowing it to quickly use nuclear weapons against an advancing Indian army (and just as worrisome, the mobility of these missiles raises concerns about secure military custody of the weapons).<sup>83</sup> Pakistan does not publish a formal nuclear doctrine, though its leaders have declared that its nuclear weapons exist to deter India.

India has approximately 100 warheads in its arsenal and is in the process of developing a nuclear triad. India possesses nuclear-capable aircraft, nuclear-capable missiles that cover both short and long ranges, and is currently developing ICBMs as well as submarine-launched missiles. India has a long-held policy of the "no first

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79. Hans M. Kristensen and Robert S. Norris, "Pakistan's nuclear forces, 2011," *Bulletin of the Atomic Scientists* 67, No. 4 (July/August 2011).

80. Nuclear Threat Initiative, "Pakistan- Country Profiles," December 2014, available from [www.nti.org/country-profiles/pakistan/nuclear/](http://www.nti.org/country-profiles/pakistan/nuclear/).

81. Saeed Shah, "Pakistan in Talks to Acquire 3 Nuclear Plants From China," *Wall Street Journal*, January 20, 2014.

82. Paul K. Kerr and Mary Beth Nikitin, "Pakistan's Nuclear Weapons: Proliferation and Security Issues," *CRS Report for Congress*, February 13, 2013.

83. Usman Ansari, "Experts: Missile Test Firing Shows Development Complete," *Defense News*, November 6, 2013.

use” of nuclear weapons. The party of the Indian Prime Minister Narendra Modi has vowed to “revise and update” India’s nuclear doctrine writing that “the strategic gains acquired by India during the Atal Bihari Vajpayee regime on the nuclear programme have been frittered away by the Congress.”<sup>84</sup> Thus it is possible that the doctrine will be altered both in response to Pakistan’s nuclear development and recent changes in China’s doctrine.

The two states have been in conflict since their founding and violent partition in 1948. They fought wars in 1965 over Kashmir and in 1971 when East Pakistan became the independent state of Bangladesh. In May 1998, India conducted five nuclear tests and within weeks Pakistan responded with six tests of its own. The most dangerous period in the nuclear era occurred a year later in 1999 when Pakistani forces crossed the Line of Control in Kashmir and occupied part of the Kargil district, resulting in an Indian counter-attack and worldwide fears of nuclear war. A 2001 terrorist attack on the Indian parliament in New Delhi and another terrorist attack in Mumbai in 2008 also flamed tension between the nuclear adversaries and raised the specter of nuclear conflict.

A terrorist attack or small conflict on the border between the two states could quickly escalate to the nuclear level. In 2004 India developed the “Cold Start” military doctrine, a plan to mobilize conventional forces on the Pakistani border within 48 hours of receiving orders. The goal of the plan is to quickly overwhelm Pakistan with limited territorial aims before international actors can intervene. Because of its conventional inferiority, however, analysts assume Pakistan would resort to nuclear weapons early in a large-scale conventional war. Its recent development of battlefield nuclear weapons indicates a lowering of the threshold for nuclear use. Indeed, former Pakistani Ambassador to the United States Maleeha Lodhi has argued that Pakistan needed to develop these tactical weapons “to counterbalance India’s move to bring conventional

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84. The 2014 “Election Manifesto” of the BJP is available from, [www.bjp.org/images/pdf\\_2014/full\\_manifesto\\_english\\_07.04.2014.pdf](http://www.bjp.org/images/pdf_2014/full_manifesto_english_07.04.2014.pdf).

military offensives to a tactical level,” suggesting these weapons are to be deployed against advancing Indian troops. Once nuclear weapons are used, however, even if only tactical, it might be difficult to control the escalation.

### Iran, Israel, and the United States

Israel is estimated to possess approximately 75 to 200 nuclear weapons.<sup>85</sup> It has advanced missile capabilities with its Jericho ballistic missile, nuclear-capable aircraft, and may deploy cruise missiles with nuclear warheads on its Dolphin-class submarines, possibly providing it with a second strike capability.<sup>86</sup> Because of its policy of nuclear opacity (*animut*) and promise not “to be the first country to introduce nuclear weapons in the Middle East,”<sup>87</sup> we know little about Israel’s nuclear doctrine.

Iran’s nuclear program is at least temporarily halted under the Joint Comprehensive Plan of Action struck with the international community in 2015. But if the limits in this deal were contravened for any reason, it is possible that Iran could still join the nuclear club. If Iran acquires nuclear weapons, it is also possible that other states in the region, including Turkey, Egypt, or Saudi Arabia could attempt to acquire nuclear weapons in response.<sup>88</sup> While fears of a rapid and

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85. The Arms Control Association provides this range. See “Nuclear Weapons: Who Has What at a Glance,” *Arm Control Association*, June 13, 2014. The Federation of American Scientists put the estimate at 80 weapons. “Status of World Nuclear Forces,” *Federation of American Scientists*, April 30, 2014.

86. Peter Beaumont and Conal Urquhart, “Israel deploys nuclear arms in submarines,” *The Guardian*, October 11, 2003, available from <https://www.theguardian.com/world/2003/oct/12/israel1>

87. Robert S. Norris, William M. Arkin, Hans M. Kristensen and Joshua Handler, “Israeli Nuclear Forces, 2002,” *Bulletin of the Atomic Scientists* 58, No. 5 (September 2002): 73.

88. James M. Lindsay and Ray Takeyh, “After Iran Gets the Bomb: Containment and Its Complications,” *Foreign Affairs* 89, No. 2 (March/April 2010): 33-49.

complete nuclear cascade in the region are probably overblown, it is possible, if not likely, that one or two additional states would join the nuclear club within the course of several decades if Iran goes nuclear.<sup>89</sup>

The nuclear balance of power between Iran and its neighbors could be highly unstable and would likely lack many of the safeguards that existed between the superpowers during the Cold War, including: the absence of a direct line of communication between Iran and its rivals, short timelines for nuclear-armed missiles to travel between states, the lack of secure second-strike capabilities (at least initially), and, in Israel, a lack of strategic depth and a strategic culture that emphasizes preemption.

Iran and Israel have viewed each other as strategic competitors since the Iranian Revolution in 1979; Israel has directly come into conflict with Iran's proxies, Hezbollah and Hamas. Iran has also frequently clashed with Israel's superpower patron, the United States. In 1988, the United States and Iran engaged in a major naval battle as part of the Tanker War, the U.S. Navy's largest engagement since the end of World War II. Iran sponsored proxy attacks that killed U.S. service personnel for a decade in Iraq and Afghanistan. And Tehran and Washington frequently exchange threats and counter-threats in the Persian Gulf and over the Strait of Hormuz.<sup>90</sup> It is, therefore, conceivable that a future conflict involving a nuclear-armed Iran and Israel or the United States could result in a nuclear exchange. If other states in the region, such as Turkey or Saudi Arabia, also acquired nuclear weapons, the nuclear balance would be even less stable and a poly-nuclear Middle East might be the most likely candidate for the next nuclear war.

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89. Matthew Kroenig, *A Time to Attack: The Looming Iranian Nuclear Threat* (New York: Palgrave Macmillan, 2014).

90. For example, see Rick Gladstone, "Noise Level Rises Over Iran Threat to Close Strait of Hormuz," *New York Times*, December 28, 2011.

## *Nuclear Terrorism*

Since the terrorist attacks on September 11, 2001, scholars, analysts, and politicians have focused on the nexus of nuclear weapons and terrorism. In his closing statement at the 2012 Nuclear Security Summit, U.S. President Barack Obama concluded, “We’ve agreed that nuclear terrorism is one of the most urgent and serious threats to global security.”<sup>91</sup> Though there has been some debate on how seriously this threat should be taken,<sup>92</sup> evidence indicates that terrorist organizations have both expressed a desire for nuclear weapons and made attempts to buy or seize nuclear material. Declassified documents from the United States suggest al Qaeda leader Osama bin Laden directed his associates to purchase uranium.<sup>93</sup> In addition, Chechnya-based separatist groups, Lashkar-e-Taiba in South Asia, and Aum Shinrikyo in Japan have also expressed the desire for nuclear weapons in the past.<sup>94</sup>

Most analysts consider it unlikely that a state would knowingly provide a terrorist group with a bomb, but it is conceivable that a group could steal one. This fear is especially acute in the case of Pakistan, where an unstable government with a growing nuclear arsenal exists in an area with many terrorist organizations. The government of Pakistan has taken steps in recent years to allay these

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91. White House, Office of the Press Secretary, “Remarks by President Obama at Opening Plenary Session of the Nuclear Security Summit,” Coex Center, Seoul, Republic of Korea, March 27, 2012.

92. John Mueller is probably the most notable skeptic of the nexus between terrorists and nuclear weapons. See *Overblown: How Politicians and the Terrorism Industry Inflate National Security Threats, and Why We Believe Them* (New York: Free Press, 2006).

93. See Documents 2 and 3 in “Nuclear Terrorism: How Big a Threat? Is al-Qaeda Trying to Get a Bomb? Documents Trace U.S. Nuclear Counter-Terror Efforts,” National Security Archive Electronic Briefing Book No. 388, September 2012, available from [www2.gwu.edu/~nsarchiv/nukevault/ebb388/](http://www2.gwu.edu/~nsarchiv/nukevault/ebb388/).

94. Graham Allison, “Nuclear Terrorism Fact Sheet,” *Belfer Center for Science and International Affairs*, Harvard Kennedy School, April 2010.

fears, yet reason for concern remains.<sup>95</sup>

A second means by which a terrorist group could attain a nuclear capability is by obtaining fissile material and constructing its own crude nuclear bomb. The main challenge for terrorist organizations seeking this capability is finding sufficient fissile material. Approximately 8 kilograms of plutonium or 25 kilograms of highly enriched uranium (HEU) is necessary for a bomb. Since 9/11, the United States, Russia, the IAEA, and other partners have taken on a number of efforts to decrease the risks of terrorists accessing nuclear material. United Nations (UN) Security Council Resolution 1540, the 2005 Amendment to the Convention on the Physical Protection of Nuclear Material, and the 2005 International Convention for the Suppression of Acts of Nuclear Terrorism all seek to increase global cooperation to prevent nuclear terrorism. Overall, the global stocks of HEU and plutonium are decreasing, but the sheer volume of global fissile material makes this an on-going challenge and the U.S. budget for these activities has recently been cut.

Unlike nuclear-armed states, it would be relatively difficult to deter terrorists from taking action.<sup>96</sup> In other words, if efforts to keep nuclear weapons out of terrorist hands fail even once, we may very well witness a nuclear 9/11.

### *Conclusion*

This chapter examined the prospects for the next nuclear war. While we all hope that nuclear weapons will never be used again, this chapter suggests that as long as nuclear weapons and geopolitical conflict exist, there remains a nonzero risk of a nuclear exchange. To analyze this threat, this chapter looked to the only pre-

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95. Mark Fitzpatrick, *Overcoming Pakistan's Nuclear Dangers* (Adelphi Series 443, London: International Institute for Strategic Studies, 2014).

96. For a strategy to deter terrorism, see Matthew Kroenig and Barry Pavel, "How to Deter Terrorism," *Washington Quarterly* 35, No. 2 (March 2012): 21-36.

vious instance of nuclear use, presented the theoretical mechanisms by which nuclear war might transpire, and identified the nuclear-armed actors and related conflicts that could result in nuclear war.

Fortunately, a next nuclear war is not preordained and there are a number of steps that the United States can take to reduce the risk. The first and most important step is to openly recognize, understand, and acknowledge the threat. U.S. leaders rarely talk about nuclear war. When authorities discuss the litany of threats posed by the spread of nuclear weapons, a frank discussion of nuclear war is often absent. For example, in explaining why he is opposed to allowing Iran to develop nuclear weapons, President Obama said:

In addition to the profound threat that it poses to Israel, one of our strongest allies in the world; in addition to the outrageous language that has been directed toward Israel by the leaders of the Iranian government—if Iran gets a nuclear weapon, this would run completely contrary to my policies of nonproliferation. The risks of an Iranian nuclear weapon falling into the hands of terrorist organizations are profound. It is almost certain that other players in the region would feel it necessary to get their own nuclear weapons. So now you have the prospect of a nuclear arms race in the most volatile region in the world, one that is rife with unstable governments and sectarian tensions. And it would also provide Iran the additional capability to sponsor and protect its proxies in carrying out terrorist attacks, because they are less fearful of retaliation.<sup>97</sup>

President Obama never explicitly argued that a nuclear-armed Iran could result in a nuclear attack against the United States, Israel, or other states. Perhaps the threat was meant to be implicit in the

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97. Jeffrey Goldberg, “Obama to Iran and Israel: ‘As President of the United States, I Don’t Bluff,’” *The Atlantic*, March 2, 2012.

discussion. Or perhaps Obama and others like him do not want to be accused of hysteria for trumpeting the alarm on such a low risk, high consequence outcome. Regardless of the cause of this reticence, nuclear war is a possible, and the most severe, consequence of nuclear weapons proliferation. U.S. leaders should explicitly confront this uncomfortable truth head on. After all, if we do not accurately articulate the threat, it will be difficult to adequately address it.

Elites in others states are less shy about broaching the subject. North Korean leaders regularly threaten nuclear use.<sup>98</sup> Pakistan's leaders have boasted to British officials about how quickly they could launch a nuclear attack against India.<sup>99</sup> Chinese state-owned media has proudly reported the death and destruction that a Chinese nuclear attack could inflict on the United States.<sup>100</sup> And President Putin recently explained to a youth group in Russia, "that Russia is one of the world's biggest nuclear powers. These are not just words—this is the reality. What's more, we are strengthening our nuclear deterrent capability."<sup>101</sup>

Once U.S. leaders more frankly acknowledge the threat of nuclear war, they must work with their counterparts abroad to take the necessary steps to stop it. This means taking a variety of steps to stabilize relations among existing nuclear powers. Most importantly, however, it means promoting strong nonproliferation policies to prevent the spread of nuclear weapons to more countries. With

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98. For example, "North Korea ramps up nuclear rhetoric as UN vote looms," *BBC World News*, March 7, 2013, available from [www.bbc.com/news/world-asia-21698728](http://www.bbc.com/news/world-asia-21698728).

99. Nicholas Watt, "Pakistan boasted of nuclear strike on India within eight seconds," *The Guardian*, June 15, 2012.

100. Quoted in "China reveals its ability to nuke the US: Government boasts about new submarine fleet capable of launching warheads at cities across the nation," *Daily Mail*, November 2, 2013.

101. President of Russia, "Seliger 2014 National Youth Forum," August 29, 2014, full transcript available from [eng.kremlin.ru/transcripts/22864](http://eng.kremlin.ru/transcripts/22864).

each additional state that joins the nuclear club, the probability of the next nuclear war occurring in our lifetimes increases by some unknown margin. While the probabilities involved may be low, they might be just enough.