HOPE SPRINGS ETERNAL: PERCEPTIONS OF MUTUAL VULNERABILITY BETWEEN NUCLEAR RIVALS

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Abstract

Do nuclear-armed rivals perceive a condition of "mutual vulnerability" to be inescapable? Such states generally have two long-term options when it comes to dealing with such a situation. On the one hand, they can accept that such a balance would likely endure, and seek only to maintain secure second-strike capabilities. On the other hand, they can reject the strategic circumstances as potentially robust, and pursue capabilities that promise to make nuclear war more tolerable. This dissertation examines two cases of nuclear rivalries in order to understand which position or approach tends to be adopted, and why.

The bulk of the project uses archival evidence to illuminate how U.S. and Soviet decision-makers wrestled with mutual vulnerability as it emerged and deepened during the Cold War. Analysis of this case reveals that the superpowers were inclined to reject the idea that their strategic situation was inescapable. Though the technical basis for a highly durable nuclear balance was in place by the early-to-mid 1960s, there was never a clear or constant consensus within U.S. or Soviet policy circles that mutual vulnerability would persist. As a result, each side continuously tried to liberate itself from the strategic dilemma, either by building up capabilities or modifying nuclear strategy.

Today the United States and the People's Republic of China, which comprise the second nuclear rivalry examined by this study, risk falling into a similar pattern. Nuclear exchange calculations establish that while mutual vulnerability between these two countries exists, the United States might still be able to reduce its risk under certain conditions. Put another way, the quantitative disparity between U.S. and Chinese strategic forces implies that certain nuclear war outcomes could favor the United States. In-depth interviews with U.S. and Chinese experts and former officials demonstrate that perceptions of the balance partly confirm this picture. While

both sides appear to believe that mutual vulnerability is a current strategic fact, there is much uncertainty about its persistence. Historical lessons are thus key to navigating the United States and China away from a Cold War-style relationship premised predominantly on competition.

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Chapter 1: Introduction

Do nuclear-armed rivals perceive conditions of "mutual vulnerability" to be inescapable? Two states enter into such a situation when an exchange between their nuclear capabilities would cause extraordinary damage to both sides. Typically this occurs when neither state can guarantee a successful disarming attack against the nuclear forces of the other under likely conflict conditions.[1] In general there are two types of approaches to mutual vulnerability that nuclear rivals can take over the long term. On the one hand, a state can accept that such a balance would likely endure, and seek only to acquire and maintain capabilities that promise to withstand and respond to a disarming attack while rejecting first-strike forces and perfect defenses.[2,3] On the other hand, nuclear rivals can attempt to evade or overcome mutual vulnerability, or alleviate some of the drawbacks. Instead of resigning themselves to the notion of a robust strategic situation, they can seek to manipulate the balance to their advantage, pursuing first-strike or damage limitation capabilities that promise to make nuclear war more tolerable.[4] For two nuclear rivalries in particular – the Cold War superpowers, and the United States and China today – which position or approach was (or is) preferred, and why?

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[1] To rephrase, for the purpose of this discussion two states are defined as mutually vulnerable when each side can assure its second-strike forces under likely conflict conditions. A second-strike nuclear capability is defined as an array of nuclear forces that – through platform mix, basing modes and alert posture – can withstand an attack intended to fully disarm the defender and subsequently retaliate against the aggressor.

[2] This dissertation invokes the term "balance" to describe the collective array of strategic capabilities maintained by two rival states, regardless how the quality or quantity of those capabilities stack up to one another. Alternate phrases utilized throughout the dissertation include "force balance," "balance of forces," "ratio of forces," "strategic situation", and "strategic circumstances."

[3] For a synthesis of the early deterrence literature making the argument that this approach is most conducive to stable relations between nuclear rivals, see Steven E. Miller (1988), *The limits of mutual restraint: Arms control and the strategic balance*, PhD dissertation, retrievable from UMI (Accession Order No. 8822307), pp. 92-222.

[4] For more on the difficulties of this approach, see Charles L. Glaser (1990), *Analyzing Strategic Nuclear Policy* (Princeton, NJ: Princeton University Press), pp. 145-155.

In summary, this dissertation found that rejection of the inescapability of mutual vulnerability was the predominant response by the United States and Soviet Union during the Cold War, the primary rivalry analyzed here. Though the technical basis for a highly durable nuclear balance was in place by the early-to-mid 1960s, there was never a clear or constant consensus within U.S. or Soviet policy circles that mutual vulnerability would persist. Hope sprang eternal that the superpowers could liberate themselves from the strategic dilemma; as a result, each side continuously tried to attempt this feat, either by building up capabilities or modifying nuclear strategy.

Today the United States and China, which comprise the second nuclear rivalry examined by this study, risk falling into a similar pattern. Nuclear exchange calculations establish that while mutual vulnerability between these two countries exists, the United States might still be to reduce its risk under certain conditions. Put another way, the quantitative disparity between U.S. and Chinese strategic forces implies that some nuclear war outcomes could favor the United States. In-depth interviews with U.S. and Chinese experts and former officials demonstrate that perceptions of the balance partly confirm this picture. While both sides appear to believe that mutual vulnerability is a current strategic fact, there is much uncertainty about its persistence. Historical lessons are thus key to navigating the United States and China away from a Cold War-style relationship premised predominantly on competition.

This introduction proceeds in three parts. The first section discusses the benefits of focusing a research project on mutual vulnerability. The second section describes the analytical framework and evidence used to capture how the U.S.-Soviet and U.S.-China rivalries grappled or are grappling with the existence or possibility of mutual vulnerability. Finally, the introduction closes with an overview of the different chapters comprising the dissertation.

Project utility: the case for studying mutual vulnerability

This project makes several contributions to the scholarly and nuclear policy literatures. First, it addresses inconsistencies in the scholarly discourse concerning the role of the strategic balance in relations between nuclear rivals. Specifically, the existing literature offers no conclusive expectations when it comes to how policy actors respond to mutually vulnerable relations with an adversary.[5] Some research suggests that during the Cold War, the United States and Soviet Union accepted the permanence of their strategic situation, and that this understanding was responsible for the first serious efforts to negotiate nuclear arms control treaties.[6] Other studies imply the opposite - that mutual vulnerability was ultimately rejected by the two superpowers on account of its incompatibility with nuclear doctrines incorporating any degree of counterforce targeting.[7] A third perspective posits that conventional wisdom about the Cold War tends to portray the Soviets as denying mutual vulnerability and the United States as accepting it.[8]

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[5] Alexander George, Philip Farley, and Alexander Dallin, eds. (1988), *U.S.-Soviet Security Cooperation: Achievements, Failures, Lessons* (New York: Oxford University Press), p. 644; for the broader structure of this argument see Steve Weber (1990), "Realism, Détente, and Nuclear Weapons," *International Organization*, Volume 44, Issue 1, p. 66. As highlighted by the most recent scholarly review of the nuclear weapons literature, the empirical foundation for much of the collective "nuclear wisdom" is still unclear; Erik Gartzke and Matthew Kroenig (2016), "Nukes with Numbers: Empirical Research on the Consequences of Nuclear Weapons for International Conflict,"*Annual Review of Political Science*, Volume 19, p. 400.

[6] Emanuel Adler (1992), "The Emergence of Cooperation: National Epistemic Communities and the International Evolution of the Idea of Nuclear Arms Control," *International Organization*, Volume 46, Number 1; Weber (1990) offers a similar perspective. Matthew Evangelista argues the Soviet realization did not occur until the Gorbachev era; see Matthew Evangelista (1999), *Unarmed Forces: The Transnational Movement to End the Cold War* (Ithaca, NY: Cornell University Press).

[7] The most systematic presentation of this argument can be found in Miller's 1988 doctoral dissertation, op. cit. However, a concise summary can be found in Steven Miller (1985), "The Viability of Nuclear Arms Control: US Domestic and Bilateral Factors," *Bulletin of Peace Proposals*, Volume 16, Issue 3, pp. 265-266.

[8] John A. Battilega (2004), "Soviet Views of Nuclear Warfare: The Post-Cold War Interviews," in Henry D. Sokolski, *Getting MAD: Nuclear Mutual Assured Destruction, Its Origins and Practice* (Carlisle, PA: Strategic Studies Institute), p. 151.

The emergent condition of U.S.-China mutual vulnerability does not make things much clearer. U.S. policy stipulates a commitment to strategic stability with China, but the United States has not officially decided whether to accept or reject the current strategic situation.[9] Chinese nuclear policy and forces have long appeared consistent with acceptance of mutual vulnerability, but there is some concern that this may change.[10] These ambiguities highlight the need for a deeper analysis of the empirical record to more definitively illustrate the conditions under which actors acknowledge mutual vulnerability and its lasting nature, as well as the impact of this condition on the formulation of strategic policy.

Second, this project elevates an aspect of the strategic calculus between nuclear rivals that has not been subjected to systematic analytical scrutiny: "strategic assessments," defined here as mathematical models of the effects of a nuclear attack mounted by one state against another, or of a nuclear exchange between two states. The comparison of opposing nuclear capabilities has long constituted part of the threat assessment enterprise, but how state actors evaluate the consequences of employing those capabilities has only received scattered treatment. Existing studies on perceptions of balances of power tend to focus on gross measures like force size and composition and assess their effects on specific attempts at strategic coercion.[11] Detailed

[9] United States Department of Defense (DOD, 2010), *Ballistic Missile Defense Review Report* (Washington, DC), April, p. 34; DOD (2013), *Report on Nuclear Employment Strategy of the United States, Specified in Section 491 of 10 U.S.C.*, unclassified summary (Washington, DC), June 12, p. 3; Charles L. Glaser and Steve Fetter (2016), "Should the United States Reject MAD?: Damage Limitation and U.S. Nuclear Strategy toward China," *International Security*, Volume 41, Number 1, pp. 49-98.

[10] Fiona S. Cunningham and M. Taylor Fravel (2015), "Assuring Assured Retaliation: China's Nuclear Posture and U.S.-China Strategic Stability," *International Security*, Volume 40, Number 2, p. 8.

[11] Richard K. Betts (1987), *Nuclear Blackmail and Nuclear Balance* (Washington, DC: Brookings Institution Press); William C. Wohlforth (1993), *The Elusive Balance: Power and Perceptions During the Cold War* (Ithaca, NY: Cornell University Press); Matthew Kroenig (2013), "Nuclear Superiority and the Balance of Resolve: Explaining Nuclear Crisis Outcomes,"

examinations of the institutions responsible for threat assessment either do not touch on the anticipated results of nuclear exchanges[12] or do not speak to how such assessments track with strategic preferences over time.[13] This is probably due to the highly sensitive nature of these calculations, an issue that still affects the availability of information related to official U.S. assessments after the early 1960s and to Soviet assessments throughout the Cold War.[14,15] With

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International Organization, Volume 67, Issue 1, pp. 141-171. An exception is Daryl Press' work; his analysis of the Berlin and Cuban Missile Crises does consider some contemporary estimates of nuclear war's consequences on top of static comparisons and operational factors; see Daryl Press (2007), *Calculating Credibility: How Leaders Assess Military Threats* (Ithaca, NY: Cornell University Press), pp. 24, 85-94, 123-127.

[12] One of the best studies on how U.S. capability assessments affect perceptions among national security officials is John Prados (1982), *The Soviet Estimate: U.S. Intelligence Analysis and Soviet Strategic Forces* (Princeton, NJ: Princeton University Press). However, Prados' discussion of national intelligence estimates on Soviet nuclear forces does not touch on the effects of nuclear war, probably because this topic was not part of the intelligence community's repertoire, much to the dismay of some. See Memorandum From the Deputy Director for Intelligence, Central Intelligence Agency (Gates) to the Director of Central Intelligence (1982), April 30, "John Prados Book The Soviet Estimate," CIA Historical Review Program, Freedom of Information Act Electronic Reading Room, pp. 6-7.

[13] Michael Salman, Kevin J. Sullivan, and Stephen Van Evera (1989), "Analysis or Propaganda? Measuring American Strategic Nuclear Capability, 1969-1988," in Lynn Eden and Steven E. Miller, eds., *Nuclear Arguments: The Major Debates on Strategic Nuclear Weapons and Arms Control* (Ithaca: Cornell University Press), and Bruce W. Bennett (1980), *Assessing the Capabilities of Strategic Nuclear Forces: The Limits of Current Methods,* The RAND Corporation, N-1441-NA.

[14] In the 1980s some scholars sought to illuminate Soviet modeling efforts, but this enterprise remains largely opaque, at least in the open literature. For example, see Peter Almquist and Stephen M. Meyer (1984, 1985), *Insights from Mathematical Modeling in Soviet Mission Analysis (Parts I & II)*, Research Report No. 86-5 and 86-8, Soviet Security Studies Working Group, Center for International Studies, Massachusetts Institute of Technology; Stephen M. Meyer (1983), "Soviet analytical modeling for nuclear force planning," *The Adelphi Papers,* Volume 24, Issue 187, pp. 34-44; Claire Mitchell Levy (1992), *Soviet Strategic Nuclear Measures of Effectiveness*, The RAND Corporation, N-3444-AF.

[15] One group of scholars argues the lack of understanding about Soviet assessments encouraged an inaccurate portrayal of Soviet intentions. John Hines, Ellis M. Mishulovich, and John F. Shulle (1995), *Soviet Intentions 1965-1985, Volume I: An Analytical Comparison of U.S.-Soviet Assessments During the Cold War*, BDM Federal, Inc., Unclassified, excised copy, in William Burr and Svetlana Savranskaya (2009), eds., *Previously Classified Interviews with Former Soviet Officials Reveal U.S. Strategic Intelligence Failure Over Decades*, (Washington, DC: The

respect to models of nuclear war between the United States and China, as elaborated below this work is largely outdated. To address these gaps in the literature, strategic assessments are central to the way this dissertation traces how nuclear rivals judge and respond to their strategic circumstances. In other words, it seeks to explain their behavior using a variable that others have largely overlooked.

Finally, the concept of mutual vulnerability permits the application of the historical record to current policy challenges. Despite the sizable amount and variety of archival material that is constantly becoming publically available, as James Acton observes, "most contemporary nuclear strategists generally ignore the understanding of both Soviet and American nuclear decision-making processes that was built up during the Cold War."[16] Accordingly, this dissertation uses the analytical leverage of mutual vulnerability to bring U.S.-Soviet history to bear on U.S.-China nuclear relations today. While these two states are by no means engaged in a rivalry on par with the Cold War competition, the technical basis for their nuclear relationship is changing, much like it did for the United States and Soviet Union in the early 1960s. Specifically, the U.S.-China deterrent relationship is evolving from in which only China was vulnerable to devastating nuclear attack by the United States, to one in which both sides can threaten such a result; in other words, what was once a relationship characterized by U.S. dominance is increasingly seen as one of U.S.-China mutual vulnerability.[17]

National Security Archive), Electronic Briefing Book (EBB) No. 285, Document 2 (Volume I), pp. 68-69.

[16] James M. Acton (2014), "On *Not* Throwing the Nuclear Strategy Baby Out with the Cold War Bath Water: The Enduring Relevance of the Cold War," in David Ochmanek and Michael Sulmeyer, eds., *Challenges in U.S. National Security Policy: A Festschrift Honoring Edward L. (Ted) Warner*, The RAND Corporation, CP-765-RAS, pp. 108-109.

[17] By several expert accounts, U.S.-China mutual vulnerability already does or will soon comprise a "fact of life." For example, Elbridge A. Colby and Abraham M. Denmark (2013), *Nuclear Weapons and U.S.-China Relations: A Way Forward*, A Report of the PONI Working

Moreover, the question and treatment of mutual vulnerability by both sides has implications for both arms race stability and crisis stability between the two states. China takes official U.S. unwillingness to openly recognize mutual vulnerability as an indication that it is working to deny Chinese second-strike forces, or at least leaving the door open to do so. In turn this potentially puts pressure on Chinese leaders to revisit their longstanding view that a "small" second-strike capability is sufficient for their security needs.[18] There is also some concern that a mutually vulnerable relationship could "cancel out" the deterrent effect of strategic nuclear capabilities on both sides, thereby making it safe for or encouraging limited conflicts with conventional weapons.[19,20] Laying out the less stable aspects of the Cold War experience can improve the chances that the contemporary U.S.-China rivalry might avoid them.

Group on U.S.-China Nuclear Dynamics, Center for Strategic and International Studies (CSIS), p. 19; U.S. Department of State International Security Advisory Board (2012), *Report on Maintaining U.S.-China Strategic Stability*, October 26, p. 3; Jeffrey Lewis (2012), "The Fifty-Megaton Elephant in the Room," *Foreign Policy,* September 20; William J. Perry, Brent Scowcroft, and Charles D. Ferguson (2009), *U.S. Nuclear Weapons Policy*, Independent Task Force Report No. 62, Council on Foreign Relations, p. 45. That being said, the exact nature of the U.S.-China deterrent relationship is still a matter of debate; see Brendan Rittenhouse Green and Austin Long, Matthew Kroenig, Charles L. Glaser and Steve Fetter (2017), "Correspondence: the Limits of Damage Limitation," *International Security,* Volume 42, Number 1, pp. 93-207.

[18] Hui Zhang (2012a), "How US restraint can keep China's nuclear arsenal small," *Bulletin of the Atomic Scientists*, Volume 68, Issue 4, pp. 74-75.

[19] In other words, it is unclear whether the U.S.-China relationship will succumb to the "stability-instability paradox," a debate over which has occupied scholars and policy-makers since the Cold War. One side of this discussion argued that strategic nuclear weapons could only deter a nuclear or major conventional attack; as a result they claimed that assured retaliatory capabilities deployed by both nuclear superpowers opened the door to lower levels of conflict. Another group maintained that reciprocal deployment of secure second-strike forces produced a stabilizing condition known as mutually assured destruction (MAD); since the superpowers could never be certain that a small incursion would not escalate across the nuclear threshold, neither would risk initiating direct conflicts with the other in key areas of interest. Assessing which theory accounts for more of U.S. and Soviet decision-making during crises throughout the Cold War is not a straightforward exercise. U.S. nuclear strategy and doctrine arguably took direction from both schools of thought, and while tensions between superpowers never escalated to direct conventional or nuclear blows, they did not avoid facing off indirectly through proxy

Research design: how this project examines mutual vulnerability

The conceptual premise of this dissertation begins with the argument that there is a structure of international politics defined by the global distribution of military capabilities, and the deployment of nuclear weapons constitutes part of this structure.[21] The emergence of mutual vulnerability between two states can be thought of as a qualitative change to the balance between their two sets of nuclear capabilities as well as to the structure of international system.[22] The primary research goal is to evaluate how this structural change is "translated and operationalized

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conflicts. For early work on the paradox, see Glenn Snyder (1965), "The Balance of Power and the Balance of Terror," in Paul Seabury, ed., *The Balance of Power* (San Francisco, CA: Chandler Publishers), pp. 184-201; Paul H. Nitze (1976), "Assuring Strategic Stability in an Era of Détente," Foreign Affairs, Vol. 54, No. 2, pp. 207–232; Colin Gray (1980), "Strategic Stability Reconsidered," *Survival*, Volume 109, Issue 4, pp. 135-154; Albert Wohlstetter (1985),"Between an Unfree World and None: Increasing Our Choices," *Foreign Affairs*, Volume 63, Issue 5, pp. 962-994. On the MAD school of thought, see Robert Jervis (1989), *The Meaning of the Nuclear Revolution: Statecraft and the Prospect of Armageddon* (Ithaca, NY: Cornell University Press). For how the paradox manifested in U.S. and Soviet policy, see Thomas M. Nichols (2014), *No Use: Nuclear Weapons and U.S. National Security* (Philadelphia, PA: University of Pennsylvania Press), p. 29; Aaron L. Friedberg (1982), "The Evolution of U.S. Strategic 'Doctrine' – 1945 – 1981," in Samuel P. Huntington, ed., *The Strategic Imperative: New Policies for American Security* (Cambridge, MA: Ballinger Publishing Company), pp. 57, 65.

[20] For a compelling analysis on the stability-instability paradox in the U.S.-China context, see Thomas J. Christensen (2012), "The Meaning of the Nuclear Evolution: China's Strategic Modernization and U.S.-China Security Relations," *Journal of Strategic Studies*, Volume 35, Issue 4, pp. 447-487. Avery Goldstein has also pointed out that official positions of and statements by the Chinese government indicate beliefs in the stability-instability paradox; see Avery Goldstein (2013), "First Things First: The Pressing Danger of Crisis Instability in U.S.-China Relations," *International Security*, Vol. 37, No. 4, pp. 65-66. See also Aaron L. Friedberg (2012), "Bucking Beijing: An Alternative U.S. China Policy," *Foreign Affairs*, Volume 91, Issue 5, p. 53; Charles L. Glaser (2015), "A U.S.-China Grand Bargain? The Hard Choice between Military Competition and Accommodation," *International Security,* Vol. 39, No. 4, pp. 69-70.

[21] Kenneth Waltz (1979), *Theory of International Politics* (Reading, MA: Addison-Wesley).

[22] This assumption builds on the work of Steve Weber on nuclear deterrence as structural change. Weber (1990), pp. 62-65.

into the behavior of state actors."[23] In other words, mutual vulnerability can be thought of as a materielly-driven stimulus; this project endeavors to account for how the signals emitted by that stimulus were interpreted. Specifically, do nuclear rivals see the change in their strategic situation caused by the emergence of mutual vulnerability as irreversible, or as a problem that improvements in force posture or tweaks of strategy are likely to resolve?

To answer this question, each case sought to get as close as possible to the official players and mechanisms most critical to the overall direction of strategic policy on both sides of a nuclear rivalry. This was methodologically most feasible for U.S. nuclear strategy during the Cold War, which was driven by an interagency process that is increasingly illuminated by the ongoing declassification process at historical archives.[24] The influence of different entities varied slightly over time, but this process typically involved White House officials from the National Security Council (NSC), policy or strategy officials within the Departments of State and Defense, military leaders like the Joint Chiefs of Staff (JCS), and members of the intelligence community, such as the Central Intelligence Agency (CIA).[25] The evolution of Soviet nuclear policy remains more opaque, but post-Cold War interviews and the secondary literature give prominence to the Politburo (especially under Stalin and Khrushchev), as well as the Ministry of

[23] Gideon Rose (1998), "Neoclassical Realism and Theories of Foreign Policy," *World Politics*, Volume 51, Issue 1, p. 166. This article also provides an overview of major scholarly works that adopt a similar theoretical approach to this dissertation.

[24] This research uses archival data that the author collected from the official libraries of the nine presidents who served during the Cold War: Harry S. Truman, Dwight D. Eisenhower, John F. Kennedy, Lyndon B. Johnson, Richard Nixon, Gerald R. Ford, Jimmy Carter, Ronald Reagan, and George Bush. See the bibliography for an overview of the different collections reviewed from each library.

[25] For a description of the different levels of government involved in the formulation of U.S. nuclear strategy, see David Rosenberg (1983), "The Origins of Overkill: Nuclear Weapons and American Strategy, 1945-1960," *International Security*, Volume 7, Number 4, pp. 9-10.

Defense, General Staff, and leaders of the military-industrial complex.[26] Given the highly sensitive nature of details related to current U.S. and Chinese nuclear strategy, the dissertation relies on in-depth interviews to flesh out the perceptions associated with that case. Discussions between the author and U.S. and Chinese defense and foreign policy experts and some former officials provided a sense of how mutual vulnerability plays into the formulation of present policy.[27]

Each chapter surveys how these groups weigh three major issues: calculations of the balance or models of nuclear war; the effectiveness of damage limitation techniques; and the future malleability of the strategic balance. Taken together, such attitudes reveal how a particular set of actors at a particular time judges the acceptability of a particular strategic situation and assesses the state's capacity to manipulate it, if need be. The Cold War case traces U.S. and Soviet perceptions on these matters over time, while the contemporary case takes a "snapshot" of current U.S. and Chinese attitudes. The rationale for examining each of these issues is discussed in turn.

Calculations of the balance. In as close to objective terms as possible, how would conflict between two sets of strategic capabilities turn out? To answer this question, the dissertation employs strategic assessments. Based on estimates of current and future deployments of strategic offenses and defenses, these assessments compute how many targets an attacking

[26] For a description of decision-making with respect to Soviet nuclear strategy and doctrine, see David Holloway (1983), *The Soviet Union and the Arms Race* (New Haven, CT: Yale University Press), pp. 109-115; Kimberly Zisk (1993), *Engaging the Enemy: Organization Theory and Soviet Military Innovation, 1955-1991* (Princeton, NJ: Princeton University Press), Chapter 2; and Gordon S. Barrass, *The Great Cold War: A Journey Through the Hall of Mirrors* (Stanford, CA: Stanford University Press), pp. 97-99.

[27] Specifically, twenty-four interviews were conducted during 2015 about the possible acquisition by China of a secure second-strike capability against the United States and the emergence and implications of mutual vulnerability in U.S.-China relations.

force can destroy under a variety of operational and logistical assumptions; quantify the scale of destruction (for example, the number of fatalities or the fraction of industry lost); and predict the contours of the post-attack balance of strength. Strategic assessments provide information about the potential costs of nuclear war that policy actors can subsequently judge as acceptable or unacceptable.

During the Cold War, the U.S. strategic assessment business was sizeable. Elaborate models of U.S.-Soviet nuclear war were produced as standalone efforts as well as folded into larger products of the policy process, such as war plans or strategy documents. The task was taken up by a number of organizations, including autonomous or semi-autonomous bodies within the military (like the Weapons System Evaluation Group) or the executive branch (such as the Net Evaluation Subcommittee (NESC) within the NSC); ad-hoc advisory groups like the Harmon or Gaither Committees; intelligence agencies, at least for a time; and increasingly, research organizations contracted by the federal government, like the RAND Corporation. A fraction of these assessments, or at least information about their conclusions, can be found within archives of declassified material or publicly documented historical accounts of the Cold War.[28,29]

Though far less data are available when it comes to Soviet strategic assessments, the historically poor public understanding of this enterprise was improved by post-Cold War interviews with former participants in and consumers of Soviet war modeling efforts.[30] It has

[28] All source material used by this dissertation is either unclassified or declassified.
[29] Much of the work by these entities, especially through the Kennedy Administration, has been declassified and is available at historical archives like presidential libraries or online repositories like the National Security Archive. Please refer to the bibliography for a list of these sources.
[30] Levy (1992), pp. iii, 2. The most significant interview data with former Soviet officials come from John Hines, Ellis M. Mishulovich, and John F. Shulle (1995), *Soviet Intentions 1965-1985, Volume II: Soviet Post-Cold War Testimonial Evidence*, BDM Federal, Inc., Unclassified, excised copy, in Burr and Savranskaya (2009), eds., EBB No. 285, Document 2 (Volume II). See

become clearer that Soviet strategic assessment techniques were not as advanced as in the United States, either by design or because "the Soviets simply lack(ed) necessary hardware, software, and personnel to build large-scale (cutting edge) computer models."[31] Moreover, while the use of strategic assessments in U.S. policy was common from about 1950 onward, Soviet evaluations do not appear to have been part of the process until the mid-1960s.[32] At least two organizations are known to have been heavily involved in the production of official strategic assessments. The first, TsNIIMash, was the primary research institute of the Ministry of General Machine Building (MOM), the flagship bureaucratic unit of the Soviet military-industry complex. The second, Scientific Research Institute Number 6 (NII-6), was a major analytical asset of the Main Intelligence Directorate of the Soviet General Staff, under the Ministry of Defense. Key details of the assessments put together by TsNIIMash, NII-6, and the General Staff's strategy-focused Main Operations Directorate, have either been described in the aforementioned primary source interviews or are scattered throughout the U.S. literature on Soviet nuclear strategy and forces.[33]

With respect to the U.S.-China case, exchange models in the public domain have yet to reflect major changes in the nuclear balance over the past two decades, especially the growing

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in particular the interviews with Gen.-Col. (Ret.) Andrian A. Danilevich, Iu. A. Mozzhorin, and Dr. Vitalii Nikolaevich Tsygichko, available from pp. 19-69, 122-126, 136-157, respectively.

[31] Levy points out that even Soviet analysts lamented the "abominable state of military modeling." See op. cit., pp. 2, 39.

[32] The "golden age" of Soviet assessments reportedly lasted from the mid-1960s through the 1970s. Levy (1992), pp. vi, 3, 10-11; John Hines, Ellis M. Mishulovich, and John F. Shulle (1995), *Soviet Intentions 1965-1985, Volume II: Soviet Post-Cold War Testimonial Evidence*, Appendix E: Remarks on the Interviews of V.N. Tsygichko given in 1990-1991, Summary translated and prepared by Svetlana Savranskaya, in Burr and Savranskaya (2009), eds., EBB No. 285, Document 2 (Volume II), Appendix E, p. 1; Burr and Savranskaya (2009), eds., EBB No. 285, Interview with General Makhmut A. Gareev, Document 2 (Volume II), p. 76.

[33] To understand how these two organizations fit into the network of political, industrial, defense and military entities, see Burr and Savranskaya (2009), eds., EBB No. 285, Document 2 (Volume I), p. xv.

Chinese inventory of road-mobile intercontinental ballistic missiles (ICBMs).[34] As a result, the strategic assessment informing this case was compiled by the author, using equations and assumptions similar to those utilized by Cold War analyses and projections of U.S. and Chinese forces from the open literature.[35] This effort extends the existing literature by marrying previous modeling approaches to counterforce strikes against stationary and dispersed, relocatable forces, and providing a more strenuous test of U.S. first-strike capabilities through the employment of models of "generated" scenarios, in which U.S. and Chinese nuclear forces are deployed at higher alert levels than they are during peacetime.

Perceptions about the effectiveness of damage limitation. At the same time that strategic assessments portray the matchup between two sets of capabilities in a certain way, policy actors are forming and reforming perceptions about the same balance of forces. Indeed, beliefs about the strategic situation might drive policy and state behavior more so than any

[34] Research on U.S. nuclear primacy, now ten years old, went far in highlighting the revolutionary potential of post-Cold War developments in U.S. nuclear forces relative to those deployed by Russia and China, but critics took issue with the assumption that the United States could execute an all-out nuclear attack on either state with the advantage of complete strategic surprise. The degree of success that the nuclear primary thesis attributed to U.S. "bolt from the blue" attacks was undercut by the argument that the most likely of crisis conditions would motivate an advanced nuclear weapons state like Russia or China to deploy their nuclear capabilities in ways to make those forces more survivable. For the nuclear primacy thesis, see Keir A. Lieber and Daryl G. Press (2006), "The End of MAD? The Nuclear Dimension of U.S. Primacy," *International Security*, Volume 30, Number 4, pp. 7–44. Critiques of their argument were laid out by authors like Bruce G. Blair, Chen Yali and Li Bin in the Winter 2006 issue of *China Security*. See also Lantis et al (2006/2007); Peter C. W. Flory, Keith Payne, Pavel Podvig, Alexei Arbatov, Keir A. Lieber and Daryl G. Press (2006), "Nuclear Exchange: Does Washington Really Have (or Want) Nuclear Primacy?" *Foreign Affairs*, Vol. 85, No. 5, pp. 149-157.

[35] Specifically, the standard set of equations used to evaluate to the probability of destroying stationary targets was combined with techniques for modeling the barrage of mobile assets. For more details, see Keir A. Lieber and Daryl G. Press (2009), "The Nukes We Need: Preserving the American Deterrent," *Foreign Affairs*, Volume 88, Number 6, pp. 39-51 and technical appendix as well as Li Bin (2007), "Tracking Chinese Strategic Mobile Missiles," *Science and Global Security*, Volume 15, Number 1.

calculation-based picture.[36] As a consequence, in parallel with the dissertation's elevation of strategic assessments, it examines reflections on nuclear war by the strategic communities on both sides of the U.S.-Soviet and U.S.-China rivalries. The views expressed by these actors in confidential meetings and correspondence, in public statements and the open literature, and documented by secondary sources permit insight into whether the expected costs of a conflict waged with nuclear weapons were or are seen as tolerable.

Theoretically speaking, policy actors evidence recognition of a perpetually mutually vulnerable relationship if they conclude there are no realistic contingencies in which their state's current capabilities (offensive and defensive) can limit the damage from a nuclear war to an acceptable level. However, since policy discussions are rarely (if ever) framed in these terms, this dissertation tests for perceptions about the inescapability of mutual vulnerability in part by measuring the strength of views related to damage limitation. Implicit in support for damage limitation strategies and the forces they require is the notion that under certain circumstances, nuclear war can be tolerated. For example, during the Cold War, U.S. advocates of damage limitation maintained that with the appropriate "combination of counterforce offensive targeting, civil defense, and ballistic missile and air defense," the United States could keep "casualties down to a level compatible with national survival and recovery."[37] For this group, damage limitation offered a way to resolve or deny the condition of mutual vulnerability.

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[36] For some political psychologists, even the calculation-based picture is a form of perception. In the words of one prominent scholar, "there is no reality to be described that is independent of people's beliefs about it." Robert Jervis (1984), *The Illogic of American Nuclear Strategy* (Ithaca, NY: Cornell University Press), p. 38. For more on this body of work, see Robert Jervis (1976), *Perception and Misperception in International Politics* (Princeton, NJ: Princeton University Press).

[37] Glaser (1990), p. 32. For its staunchest advocates, damage limitation was the *only* approach that would allow the United States to defend its key interests. Glaser (1990), pp. 50-52, 98.

How decision-makers assess whether a state can temper the repercussions of a nuclear war can be disaggregated into two smaller queries. First, can the population be sufficiently protected? If officials have rejected or are unaware of the strategic situation's permanence, they should believe that current capabilities can reduce the damage to home territory and society to an acceptable level. On the other hand, if the enduring nature of the balance of forces is more apparent, there should be little the state can do at present to drive down prospective losses. Second, in a nuclear war, can one side emerge in a better position than the other? If escape from mutual vulnerability is possible, then so too should a relative advantage be after a nuclear war. Policy actors who are more amenable to the idea of a resilient balance should not think the post-conflict balance of strength is likely to permit a clear victor.

Perceptions about the future strategic balance. The second type of perception drawn out by this dissertation concerns how policy actors view the likelihood of future changes to the ratio of forces. Each chapter asks how domestic entities perceive the utility of larger budgets for nuclear forces or of modifications to the nature of nuclear strategy. Those who acknowledge mutual vulnerability as a permanent condition should not see either type of measure as able to drive the costs of nuclear war down to an acceptable level. From their perspective, the strategic situation is resilient, and thus insensitive to any offensive or defensive program promising a quantitative or qualitative advantage. The policy actors who do not see a mutually vulnerable balance as enduring should believe the opposite, namely that certain decisions (like increasing defense spending) can change or upend the nature of the strategic circumstances. In their view the ratio of forces should be more volatile, flexible or elastic.

Another way to get at this idea emphasizes the perceived fluidity of two states' positions relative to one other. In particular, how amenable is the strategic situation to manipulation? If

reversing or recapturing a position of advantage or superiority was seen as relatively feasible, the fixed nature of mutual vulnerability is not realized or accepted. For example, a primary objective of the strategy laid out by the Reagan Administration was to "wrest the initiative" from the Soviet Union and tilt the strategic balance back in favor of the United States. In contrast, the belief that superiority is difficult to maintain is tantamount to recognition that escape from a mutually vulnerable situation is unlikely.

A final option employed by this dissertation to gauge perceptions about the pace of change in the balance hinges on the prevalence of concerns about impending "periods of maximum danger" or "windows of vulnerability." These intervals are often used to describe imminent, relative gains by an adversary that will increase the risks of attack or war. They are typically employed to justify or advocate greater defense spending so that the windows can be avoided. What is most compelling about such periods from the perspective of mutual vulnerability is the underlying belief that one side could change the balance quickly enough to make a dangerous interval possible. As a consequence, such concerns should be more prevalent among those who do not see a mutually vulnerable situation as permanent than among those who view the strategic circumstances as unwavering.

Table 1 summarizes the types of evidence this dissertation uses to flesh out how nuclear rivals grapple with the condition of mutual vulnerability as it surfaces and persists. If they recognize or acknowledge the inescapability of a mutually vulnerable relationship, their views should align with those arrayed in the middle column. If policy-makers or strategists reject the condition, choose to ignore or try to overcome it, they should exhibit beliefs similar to those listed in the far right column. It is important to highlight that rather than binary criteria, Table 1 is composed of a series of "ideal type" perceptions. They represent paradigmatic examples that

are more helpful for categorizing observations than matching their every detail.[38] Taken together, the entries in Table 1 define the extremes of a continuum; in reality most policy-makers will situate themselves somewhere between the two. The job of this dissertation is to obtain a rough sense of where the beliefs of key actors on either side of a nuclear rivalry are situated along this spectrum.

Table 1. Observable implications of mutual vulnerability

	Mutual vulnerability is…	
	… accepted as enduring	… rejected as robust
Perceptions about the effectiveness of damage limitation		
Can strategic forces reduce the damage from a nuclear war to an acceptable level?	No	Yes
In a nuclear war, can one state come out ahead of another state? Is superiority in the post-conflict balance of strength discernible?	No	Yes
Perceptions about the future strategic balance		
Does the present and future balance appear robust or tolerant of changes in capabilities?	Yes	No
Could a position of advantage or superiority or asymmetric balance be rectified or recaptured?	No	Yes
Were there common concerns about an approaching "period of maximum danger" or "window of vulnerability" during which time one state was putatively at higher risk of attack from the other?	No	Yes

Research design limitations. As with any research design, this approach has limitations. To start, strategic assessments are not purely objective exercises. Though framed in a neutral

[38] Max Weber (1949), *The Methodology of Social Science* (Glencoe, IL: Free Press), pp. 89-104.

manner, they are not free from bias and will encompass varying degrees of subjective input, for example when it comes to the damage demands of victory and defeat. Many of the parameters built into the calculations – from the attack setting, to operational efficiencies and shortcomings, to estimates of forces on both the attacking and receiving ends – are typically subject to debate.[40] Bureaucratic and organizational tendencies can also play a substantial role; the same scenario could yield different findings depending on the agenda of the entity building the model.[41] As Zbigniew Brzezinski, national security advisor to President Jimmy Carter, surmised, "the same data were cited to support contradictory positions and interpretations" throughout the late 1970s.[42] Furthermore, the levels of uncertainty inherent in these studies can be high; historically, margins of error of up to 50 percent were not unusual for U.S. assessments.[43] Even with these complications, the strategic assessment enterprise still comprises a strictly material input to the policy process. Because they represent the most concrete attempt by domestic actors to comprehend the damage a nuclear war would entail, strategic assessments offer a primary

[40] For a critique of the U.S. strategic assessment enterprise along these lines, see Salman et al (1989); Bennett (1980); Garry D. Brewer and Bruce G. Blair (1979), "War games and national security with a grain of SALT," *Bulletin of the Atomic Scientists,* Volume 35, Number 10, pp. 18-26.

[41] For example, Lynn Eden documents how organizational tendencies were responsible for the systematic exclusion of the effects of fire in strategic assessments. As a result, U.S. war planners consistently underestimated the consequences of nuclear war. See Lynn Eden (2004), *Whole World on Fire: Organizations, Knowledge, and Nuclear Weapons Devastation* (Ithaca, NY: Cornell University Press).

[42] Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Zbigniew Brzezinski, in Document 2 (Volume II), p. 17.

[43] *Report of the Net Capabilities Evaluation Subcommittee* (1954)*,* November 3, in Net Evaluation Subcommittee (3), Box 37, Disaster File, White House Office, National Security Council Staff: Papers, 1948-1961, DDEL, p. 2. For example, the director of a strategic assessment put together for the National Security Council late in 1956 noted that "variations in any one or more of the factors could substantially alter the Subcommittee's evaluations." Memorandum of Discussion at the 306th Meeting of the National Security Council (1956), December 21, *U.S. Declassified Documents Online*, p. 2.

mechanism through which the inescapability of mutual vulnerability would have made itself known.

The emphasis on perceptions also has drawbacks, essentially because the psychological inclinations of policy actors are hard to pinpoint and measure. It is not possible to divine the true thoughts of the relevant players, only to approximate their beliefs given what is said or put down on paper, both of which likely inject bias into the process. Thus, impressions about mutual vulnerability are all ascribed on the basis of inference. Moreover, this project privileges the perceptions espoused by a certain group: officials and strategists germane to the development of national or nuclear strategy. It is possible that the beliefs of other important entities are overlooked.[44] That being said, the proximity of the selected group to the national decision-making apparatus suggests their preferences should bear more significantly than others on the state's approach to managing the nuclear balance and potentially its mutually vulnerable nature. How they dealt with the questions in Table 1 should sufficiently capture how both sides of the balance assessed nuclear war-generated loss and the elasticity of the ratio of forces.

Chapter overview

The bulk of this dissertation focuses on the Cold War, tracing the complicated sequence through which U.S. and Soviet decision-makers wrestled with the reality of mutual vulnerability as it appeared and deepened. Chapters 2 through 5 deal with the U.S. approach to the condition throughout the Cold War, while chapter 6 provides a more streamlined treatment of the Soviet experience. Chapters 7 and 8 shift the focus from the past to the present by problematizing the

[44] For example, much of the work of the scientific community was excluded, apart from any involvement in official studies of nuclear war.

contemporary understanding of U.S.-China mutual vulnerability. More detailed summaries of each chapter are provided below.

Chapter 2 traces perceptions of the U.S.-Soviet balance among Truman Administration officials. Technically speaking, the late 1940s and early 1950s were a time when the nuclear threats presented by U.S. and Soviet nuclear forces were highly asymmetric. Though the Soviet Union was unquestionably vulnerable to U.S. nuclear attack, its ability to reciprocate was questionable. Through 1951 there was general agreement between both military and civilian officials that mutual vulnerability was not an enduring part of the U.S.-Soviet strategic landscape. After the first Soviet test in 1949, the toll that nuclear war could take was accepted as par for the course; the United States was expected to recover and probably emerge in a better position than its adversary. As the administration neared its close, the prospect of thermonuclear warfare brought on by the successful U.S. test of a hydrogen bomb in 1952 effectively doubled the anticipated costs of nuclear war for the U.S. population. As a result, the strategic situation appeared less flexible to some NSC and State officials; the United States continued to outpace the Soviet Union in strategic arms production, but the utility of massive buildup called for by NSC-68 was in question.

Chapter 3 takes a look at the Eisenhower presidency, a period during which the United States became increasingly vulnerable to large-scale Soviet nuclear attack. At the same time, the large quantitative margin of U.S. forces kept open the possibility of reducing the risk of unacceptable damage under highly favorable attack conditions. Thus for the first few years of Eisenhower's presidency, the enduring nature of mutual vulnerability was universally rejected. There was general consensus at high levels that the Soviet Union could not yet deal a "crippling blow" against the United States, especially if a robust system of passive defenses was put in

place. In the mid-1950s, as the level of damage projected to accompany a nuclear war ballooned, perceptions of the balance split into two opposing camps. One group - composed of the national security advisor, secretary of state, chief of naval operations, and at times, the president himself – believed that it would be impossible to come up with a permanent solution to the problems presented by a nuclear stalemate. In contrast, the Department of Defense (DOD) and the JCS sought ways to lessen the repercussions of nuclear war. As evidence about an enduring mutually vulnerable relationship was mounting, this group had positioned the United States to attempt to escape the condition through investments in large numbers of ballistic missiles and strategic defenses.

Chapter 4 focuses on how the U.S. policy leadership perceived the strategic circumstances at a time when the technical proof of an inescapable relationship of mutual vulnerability between the two superpowers was difficult to contest. Under Kennedy the material implications of the Soviet nuclear threat increased dramatically, with the arsenal's sheer size and reach by the end of the administration prohibitively complicating U.S. chances of a successful disarming or near-disarming attack. During this process, a divide among officials over the permanence of this situation appeared early and persisted. On the one hand, the secretary of defense, much of the White House staff and the president himself recognized that a U.S.-Soviet nuclear exchange would cause a level of destruction to U.S. society, economy and military capabilities so tremendous as to be "unacceptable." On the other hand, the military services – with some support from McNamara's deputy as well as Congress – had a higher threshold for the level of damage they believed the United States could tolerate, and believed a bigger defense budget would ensure a favorable outcome.

Chapter 5 examines major decisions on nuclear strategy and capabilities during the second half of the Cold War, when the technical basis for mutual vulnerability became increasingly entrenched. Perceptions of the strategic situation's inescapability continued to catch on under Nixon and Carter, but not where it mattered most. Though several key members of their administrations believed in the enduring nature of the nuclear balance, a critical few did not. The Reagan years suspended any momentum behind the idea of a robust nuclear balance; dismissal of mutual vulnerability's potential longevity was the norm. As a result, throughout the 1970s and 1980s the United States sought to manipulate the force balance in ways that would recapture the strategic initiative and promise more favorable nuclear war outcomes.

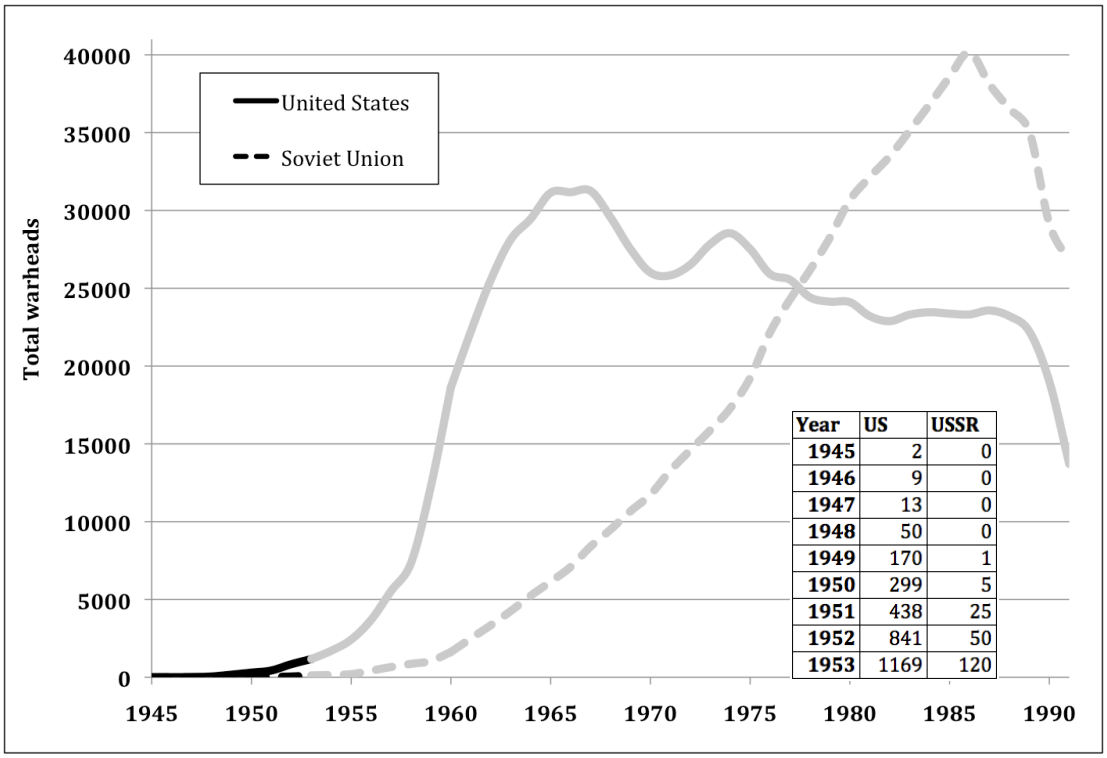
Chapter 6 tells the Soviet side of the Cold War story, which until about 1980 amounted to resistance of the condition of vulnerability to U.S. nuclear attack. The predominant underlying premise of Soviet nuclear policy under Stalin, Khrushchev, and Brezhnev held that current or future capabilities could sufficiently reduce the costs of a potential nuclear war. In part this was due to a skewed portrayal of the nuclear balance; strategic assessments were nonexistent until the 1960s, and then were artificially deflated to soften the potential consequences of nuclear war. The expansion of Soviet forces also legitimized the ideological promise of Soviet nuclear victory and served the institutional interests of powerful actors like the defense industry and the military. It was not until the early 1980s that the consequences of nuclear war strengthened the credibility of more moderately minded elements within the Soviet government, after which the permanence of mutual vulnerability was folded into the set of "new thinking" concepts driving the Soviet defense agenda in the late 1980s.

Chapter 7 assesses the current confrontation by the United States and China with the notion of mutual vulnerability. Subjecting the U.S.-China balance to exchange-modeling analysis

suggests that the two states have entered into such a relationship; under most 2018 contingencies, China would be able to inflict unacceptable damage on the U.S. territory in response. However, the size differential between the U.S. and Chinese nuclear forces implies that under some conditions, nuclear war could be viewed as highly costly but relatively favorable for the United States. Contemporary perceptions of the strategic circumstances partly coincide with these calculations. Interviews with U.S. and Chinese experts evidenced general agreement that mutual vulnerability currently exists between the two states, but whether the condition was temporary was a matter of debate. Chinese participants worried that the United States might try to build its way out of mutual vulnerability, and some U.S. interviewees believed that apparent acceptance of the condition as the long-term basis for relations might give Chinese leaders reason to think they could fight and win a limited war. Whether the U.S.-China balance becomes indefinitely robust depends on decisions by both sides.

Chapter 8 concludes the dissertation by first reviewing the project's conceptual underpinnings and the Cold War findings in light of this framework. It then points out that while the United States and China have the capacity to avoid the Cold War experience, there are factors steering the relationship both toward and away from a more competitive trajectory. In closing it explores three consultative steps the United States could take to engender a deeper appreciation of mutual vulnerability's significance, each of which would not necessarily require explicit acknowledgement of the condition.

Chapter 2: Mutual vulnerability during the Truman Administration



Year	US	USSR
1945	2	0
1946	9	0
1947	13	0
1948	50	0
1949	170	1
1950	299	5
1951	438	25
1952	841	50
1953	1169	120

Figure 1. U.S. and Soviet warhead levels during the Truman Administration[45]

[45] Hans M. Kristensen and Robert S. Norris (2013)," Global nuclear weapons inventories, 1945-2013," *Bulletin of the Atomic Scientists,* Volume 69, Issue 5, pp. 81-82. Note that the plots in Figure 1, as well as those in Figures 2-7, include both strategic and tactical nuclear warheads. Consequently, a non-trivial portion of the increase in U.S. and Soviet warhead levels is due to the demand for "battlefield" or tactical nuclear weapons, most of which the United States deployed in Western Europe in coordination with the North Atlantic Treaty Organization (NATO). For example, the U.S. tactical arsenal in Europe comprised about 3,000 weapons by 1960, and peaked at around seven thousand in 1967, while the Soviet Union may have deployed close to 25,000 of these weapons; see Tom Nichols, Douglas Stuart, Jeffrey D. McCausland (2012), eds., *Tactical Nuclear Weapons and NATO* (Carlisle, PA: Strategic Studies Institute, U.S. Army War College), pp. 4, 23, and Dave Majumdar (2016), "On the Brink: When Russia Would Use Tactical Nukes on NATO," *The National Interest*, February 22. While the warhead levels depicted in Figures 1-7 would be lower if based only on U.S. and Soviet numbers of strategic weapons, the conceptual premise of this dissertation does not depend on the inclusion or exclusion of tactical nuclear weapons in the U.S.-Soviet nuclear balance.

The years spanning the presidency of Harry S. Truman were a tumultuous time for U.S. nuclear strategy and force posture. Officials had to incorporate a new capability into a recently established defense bureaucracy and decide how many of the highly destructive weapons they wanted to acquire and deploy. Ultimately the administration ordered a tremendous buildup of strategic nuclear capabilities, growing the U.S. stockpile from a few weapons to almost 1200 by 1953.[46] Thanks to the availability of U.S. tanker aircraft and an array of foreign operating and staging bases, Truman's legacy also included several hundred strategic bombers that could attack targets on Soviet territory.[47] The unquestionable vulnerability of the Soviet Union to U.S. nuclear attack stood in contrast to the relative invulnerability of the United States during this time. Under Truman the Soviet Union never really had a clear and potent intercontinental striking capability; they had built about 120 weapons, but only about 50 bombers reach the continental United States on one-way missions.[48,49] The asymmetry in the nuclear threats presented by U.S. and Soviet nuclear forces suggests that while the material basis for mutual vulnerability emerged during

[46] Kristensen and Norris (2013), pp. 81-82.

[47] J.C. Hopkins and Sheldon A. Goldberg (1986), *The Development of Strategic Air Command, 1946-1986 (The Fortieth Anniversary History)* (Offutt Air Force Base, NE: Office of the Historian, Headquarters Strategic Air Command), p. 37.

[48] Kristensen and Norris (2013), p. 81. For an estimate of the size of the Soviet bomber force at this time, see Lincoln P. Bloomfield, Walter C. Clemens, Jr., Franklyn Griffiths (1966), *Khrushchev and the Arms Race* (Cambridge, MA: MIT Press), pp. 36-39. For the ranges of these aircraft in light of Soviet staging bases and in-flight refueling capabilities, see Central Intelligence Agency (1955), NIE 11-7-55: *Soviet Gross Capabilities for Attacks on the US and Key Overseas Installations and Forces Through 1 July 1958*, June 23, CIA Historical Review Program, Freedom of Information Act Electronic Reading Room, paragraphs 8-10. It is also worth mentioning that Stalin had initiated a ballistic missile program during this time, but large-scale deployment would not begin until the early 1960s.

[49] Intelligence estimates of Soviet capabilities at the time imply that the need for one-way missions was not seen as a limitation for the Soviet Union. Central Intelligence Agency (1950), *Estimate of the Effects of the Soviet Possession of the Atomic Bomb upon the Security of the United States and upon the Probabilities of Direct Soviet Military Action*, ORE 91-49, April 6, in Folder 5, Box 178, Central Intelligence Reports File, Intelligence File, PSF, HSTL, pp. 3-12.

these years, it may have been possible for the United States to escape from it under favorable circumstances.[50]

Table 2. Major strategic assessments during the Truman Administration[51]

Assessment	**U.S. fatalities (millions)**	**Soviet fatalities (millions)**
Harmon Report (1949)	N/A	2.7-6.7
Air Force internal estimate (1950)	3-6	N/A
ORE 91-49 (1950)	10	N/A
NSC-114/2 (1951)	9	N/A
RAND Corporation study (1952)	22-35	22-25

Through 1951 there was general agreement between both military and civilian policy actors that mutual vulnerability was not an enduring part of the U.S.-Soviet strategic landscape. Though the senior leadership constantly worried that the period of relative invulnerability would soon end on account of advancing Soviet capabilities, this issue was always viewed as rectifiable. The toll a nuclear war could take on U.S. society, industry and military capabilities was accepted as par for the course; the United States would recover, and probably emerge in a better position than its adversary. Underlying this consensus were the first strategic assessments

[50] Scholars disagree about how vulnerable Soviet nuclear forces were during the 1950s. For some the United States had a clear disarming capability, but others point out that the small number and low yields of U.S. nuclear weapons detracted heavily from U.S. confidence about the ability to "wage nuclear war successfully …while restricting damage to the West to 'acceptable' levels." See Keir A. Lieber and Daryl G. Press (2013), "The New Era of Nuclear Weapons, Deterrence, and Conflict," *Strategic Studies Quarterly,* Volume 7, Number 1, p. 13; Richard K. Betts (1987), *Nuclear Blackmail and Nuclear Balance* (Washington, DC: Brookings Institution), pp. 144-145.

[51] The Truman Administration's major statement on strategy, NSC-68, is excluded from Table 2 because the report did not feature an estimate of how much damage to expect from nuclear war. The authors of NSC-68 actually drew on intelligence estimate ORE 91-49, the third line entry in Table 2, for this information.

by U.S. entities, which as illustrated by the first four rows of Table 2, expected a nuclear attack to cause less than ten million U.S. and/or Soviet fatalities. For the U.S. Air Force, such costs were almost a routine aspect of ensuring victory. Though confidence among NSC officials was more muted, with the right investments in warning and defenses they believed the United States could negate the nascent Soviet threat and go on to secure a favorable outcome.

As the contours of a vastly more destructive type of warfare began to take shape in 1952, the strategic situation appeared to lose some of its flexibility, at least among NSC and State officials. That year the United States tested its first thermonuclear weapon, an achievement that the Soviet Union matched two years later. In addition to calculating that the destructive potential of nuclear war had doubled, the RAND Corporation reported that with thermonuclear weapons on both sides, nuclear superiority would be fleeting, outweighed by an inevitable and unwavering condition of vulnerability. The United States continued to outpace the Soviet Union as Truman left office, but the utility of massive buildup called for by NSC-68 was in question.

Military planners remain confident as the costs of nuclear war are defined

Strategic assessments were first performed around the late 1940s and focused more on prospective nuclear air campaigns mounted by one superpower against the other than on nuclear "exchanges" between the two states.[52] The first evaluations of large-scale nuclear attacks against the Soviet Union were not standalone assessments, but rather folded into the annual Joint War Emergency Plan (JWEP) produced by the JCS.[53] U.S. policy actors assumed a future war would resemble the last conflict between major world powers: a war of endurance on the European

[52] After all, the trading of nuclear blows was not technically possible until the Soviet Union acquired its first nuclear weapons in 1949.
[53] The JWEP included a separate plan on nuclear forces from the Strategic Air Command. Rosenberg (1983), pp. 9-10.

continent. The Soviet Union was envisioned as the aggressor, capitalizing on its overwhelming conventional superiority in the region to "sweep" the United States out of Europe.[54] The United States would respond with an atomic air offensive or "blitz," and then both sides would continue their strategic bombing campaigns.[55] Given the importance during World War II of the ability to mobilize national resources, it was a common presumption that if the U.S. atomic blitz could crush the Soviet urban-industrial base, victory was guaranteed.[56]

Though quantitative and operational details were scant, U.S. war planners were highly confident about how the United States would fare in a conflict with the Soviet Union. Especially within the Strategic Air Command (SAC), the service responsible for the execution of the nuclear offensive, there was little question that U.S. forces guaranteed a favorable outcome.[57] For example, regardless of how well the nuclear strike in the 1948 JWEP lived up to the assertion that it would reduce the Soviet war-making capacity by 50 percent, the post-conflict balance of strength was still anticipated to favor the United States.[58] A successfully-implemented

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[54] Marc Trachtenberg (1988/1989), "A 'Wasting Asset': American Strategy and the Shifting Nuclear Balance, 1949-1954," *International Security*, Vol. 13, No. 3, p. 22; Ernest R. May, John D. Steinbruner, and Thomas W. Wolfe (1981), *History of the Strategic Arms Competition* (Washington, DC: Office of the Secretary of Defense, Historical Office), p. 38; United States Air Force (1950), Commander's Conference Proceedings, April 25-27, Ramey Air Force Base, in William Burr (2007), ed., *Special Collection: Some Key Documents on Nuclear Policy Issues*, 1945-1990 (Washington, DC: The National Security Archive), Document 3A, pp. 20-21.

[55] In the meantime U.S. ground forces would chip away at territorial gains made by the Soviets.

[56] Friedberg (1982), pp. 57, 65.

[57] The "failure to calculate...how much damage could be expected from planned attacks" was an early criticism raised by Bernard Brodie about Air Force planning following his appraisal of SAC targets for Vandenberg in late 1950. "They simply expected the Soviet Union 'to collapse,'" he wrote. See Rosenberg (1983), p. 18.

[58] The 1948 JWEP dropped roughly 50 Hiroshima-sized nuclear bombs on 20 urban-industrial concentrations. According to Kristensen and Norris (2013), this plan was based on an accurate estimate of the size of the U.S. nuclear arsenal, which they place at 50 weapons in 1948. For a full description of this plan, known as HALFMOON, see JCS 1844/13, Brief of Short Range Emergency War Plan (HALFMOON), July 21, 1948, in Thomas Etzold and John Lewis Gaddis (1978), eds., *Containment: Documents on American Policy and Strategy, 1945-1960* (New York:

attack would "end the war," but even with complications the effects would still be "so devastating and disruptive as to halt the westward advance of Soviet ground forces."[59] Despite mounting questions about base availability and bomber attrition, Air Force leadership remained optimistic. Chief of Staff General Hoyt Vandenberg contended that the atomic campaign "could well lead to Soviet capitulation and in any event would destroy their overall capability for offensive operations."[60]

President Truman and his national security team believed that U.S. nuclear forces could seriously degrade the Soviet ability to fight, but doubted whether the SAC offensive could end the war. Truman rejected the 1948 JWEP, and that year the NSC's opening statement on national security issues adopted a measured tone, to the effect that "a relatively small number of atomic bombs could, if properly and effectively directed, set the entire Soviet industrialization program back by years and have an extremely severe effect on any Soviet military effort."[61] Unsatisfied with the current portrayal of nuclear war's costs, President Truman sought more detailed

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Columbia University Press), pp. 315-323. See also May et al (1981), pp. 38-39; David Alan Rosenberg (1979), "American Atomic Strategy and the Hydrogen Bomb Decision," *The Journal of American History*, Vol. 66, No. 1, pp. 68-69; L. Wainstein, C.D. Cremeans, J.K. Moriarty, and J. Ponturo (1975), *The Evolution of U.S. Strategic Command and Control and Warning, 1945-1972,* Institute for Defense Analyses, Study S-467, in William Burr (2012b), ed., *Declassified Pentagon History Provides Hair-Raising Scenarios of U.S. Vulnerabilities to Nuclear Attack through 1970s* (Washington, DC: The National Security Archive), EBB No. 403, Document 2, p. 16.

[59] Burr (2012b), ed., EBB No. 403, Document 2, p. 17.

[60] The plan for 1949 targeted 70 Soviet industrial and government control centers with 133 weapons; JCS 1952/1, Evaluation of Current Strategic Air Offensive Plans, December 21, 1948, in Etzold & Gaddis (1978), eds., pp. 358-360; Rosenberg (1979), pp. 70-71. The late 1940s plans were thus sized according to actual U.S. capabilities; Kristensen and Norris (2013) estimate the United States possessed approximately 50 weapons in 1948 and 170 weapons in 1949.

[61] United States Department of State (1948), *A Report to the National Security Council on Factors Affecting the Nature of the U.S. Defense Arrangement in the Light of Soviet Policies*, NSC-20/2, August 25, in Folder 5, Box 178, NSC-Meetings File, Subject File, President's Secretary's File, Harry S. Truman Papers (hereafter cited as PSF), Harry S. Truman Library, Independence, Missouri (hereafter cited as HSTL), p. 5; Rosenberg (1979), p. 69.

calculations from the military.[62] As a result, over the next year two estimates would offer the first concrete depiction of the toll that nuclear war could take and would challenge the Air Force's presumption that the atomic blitz could easily defeat the Soviet Union.

In May 1949 the Harmon Report presented its calculations of the potential effects of the SAC offensive against the Soviet Union during a conflict that year.[63] Authored by a JCS-assembled committee from across the military, the study suggested that the level of damage caused by the U.S. attack would not guarantee a quick victory. The report found that the attack could claim 2.7 million to 6.7 million Soviet lives and could cripple 30 percent to 40 percent of Soviet industrial capacity. As a whole, however, the country could recover. In contrast with the Air Force view the Harmon Committee unanimously agreed that nuclear weapons alone could not rout the adversary's war effort. Damage to fuel supplies would limit the intensity of military operations, but "…the capability of the Soviet armed forces to advance rapidly into selected areas of Western Europe…would not be seriously impaired." In other words, U.S. nuclear forces "could not guarantee 'victory' no matter how that crucial word might be defined."[64] Still, the

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[62] May et al (1981), p. 52. Shortly after an April 1949 briefing on the SAC war plan by Stuart Symington, Secretary of the Air Force, President Truman wrote to Secretary of Defense Louis Johnson to request two studies that had been initiated by Johnson's predecessor, James Forrestal. During the previous fall, while reviewing the defense budget, Secretary Forrestal had posed two questions to the JCS: "what were the chances of successful delivery of atomic bombs by aircraft against Soviet defenses…and assuming successful delivery, what would be the effect on the enemy war effort." The responses to these questions would eventually comprise the Harmon and Hull studies. For Secretary Forrestal's questions, see John Ponturo (1979), *Analytical Support for the Joint Chiefs of Staff: The WSEG Experience, 1948-1979*, Prepared for the JCS, Institute for Defense Analyses, Study S-507, pp. 175-178. p. 51. For the president's letter to Johnson, see Rosenberg (1979), p. 76. For Johnson's reply, see Louis Johnson to Harry Truman (1949), April 27, in Folder 15, Box 174, NSC-Atomic File, Subject File, PSF, HSTL.

[63] Discussion of the Harmon Report is derived from Rosenberg (1979), pp. 72-73, 86; Etzold and Gaddis (1978), pp. 360-364. Text of the full study can be found in Stephen T. Ross and David Alan Rosenberg (1990), eds., *America's Plans for War Against the Soviet Union, 1945-1950*, (New York: Garland Publishing, Inc.), Volume 11.

[64] Friedberg in Huntingdon, ed. (1983), p. 66.

Harmon Committee seemed to conclude that under the right circumstances, the benefits of a nuclear strike could outweigh the costs. By itself the offensive could not force the Soviet Union to surrender, but if launched early and in conjunction with effective conventional support, it could increase the chances of eventual defeat. As a result they endorsed the role of the atomic blitz in U.S. strategy and called for augmented production of nuclear weapons.

A few months later another study further elaborated on the limitations of Air Force plans. As the inaugural undertaking of the Weapons System Evaluation Group (WSEG), a quasi-autonomous analytical sub-body of the JCS, the effort scrutinized how well the SAC could carry out a nuclear attack.[65] Report 1 (R-1), also known as the Hull study, explored the impact of many operational variables that had yet to receive any rigorous attention, such as the effectiveness of Soviet air defenses and electronic countermeasures, U.S. heavy and medium bomber performance and accuracy, as well as logistical factors like materiel, basing and crew availability.[66] Like the Harmon Committee, the WSEG contested the notion that a nuclear offensive could easily win a future war. While the majority of U.S. strategic bombers were likely to deliver their bombs on target, the Hull report found that issues like malfunctioning guidance systems and Soviet defenses could cause attrition rates of up to 30 percent. The accuracy of attacks by remaining aircraft depended on radar-based guidance systems; as a result, even

[65] The JCS had initially tapped the Air Force for this undertaking, but they had simply replied "the strategic air offensive could be executed as planned, providing it had first call on available resources." The matter was subsequently debated within the JCS, with disagreement over the form that the study should take and the credibility of the intelligence resources on which it would be based. Eventually the JCS turned to the WSEG, which had been stood up a few months earlier with the directive of providing objective research on weapons-related issues for the Chiefs and Secretary of Defense. See Ponturo (1979), pp. 51-52; Burr (2012b), ed., EBB No. 403, Document 2, pp. 18-19; Louis Johnson to Harry Truman (1949), April 27, PSF, HSTL.

[66] The discussion of the Hull Report is based on JCS 1952/11, Evaluation of Effectiveness of Strategic Air Operations, February 10, 1950, in Ross and Rosenberg (1990), eds., pp. 156-159.

successful delivery across the board would destroy only one-half to two-thirds of the intended target set.

In spite of the questions raised by the Harmon and Hull reports, the Air Force position did not change.[67] Senior officers at a commanders' conference in April of 1950 remained optimistic about U.S. nuclear war plans. Though SAC Commander General Curtis LeMay acknowledged that the United States was "a long way from possessing the capability of destroying the Soviet striking force," he still argued that "if war were to occur this year or even next year, I believe we could probably do our job and guarantee ultimate victory for this country and do it at acceptable cost."[68] Privately within Air Force senior ranks there appeared to be some doubt about the feasibility of drawn-out nuclear war, but this only underscored the criticality of striking first.[69] Looking a few years ahead, General Anderson, the director of plans and operations in the Office of the Deputy Chief of Staff for Operations, described to fellow conferees that although the Soviet Union's expanding nuclear capabilities complicated the SAC's job, they could continue the fight for several years. Anderson's office had calculated that in 1953 an initial Soviet attack on U.S. population centers, industrial targets and nuclear forces would kill on the order of three million to six million people.[70] War-supporting industry would

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[67] Discussion in this paragraph comes from Burr (2007), ed., Documents 3A, 3B and 3D.

[68] Burr (2007), ed., Document 3B, pp. 225, 228. The atomic war plan at this point, known as OFFTACKLE, presumed a conflict with Soviet Union would last at least three years. OFFTACKLE delivered 220 nuclear bombs on 104 targets comprising the Soviet war economy and key aspects of Soviet ground advances into Europe. Burr (2007), ed., Document 3A, pp. 20-21. See also JSPC 877/59, Brief of Joint Emergency War Plan (OFFTACKLE), May 26, 1949, in Etzold & Gaddis (1978), eds., p. 324.

[69] In a letter to Vandenberg, former SAC commander General George Kenney commented how "it was quite evident to all the conferees that Plan "Offtackle" was decidedly unrealistic." The "only way that we can be certain of winning," Kenney argued, was to initiate the atomic air campaign as soon as possible. Burr (2007), ed., Document 3D.

[70] The numbers used in Anderson's analysis are consistent with the CIA's estimate at the time (i.e, ORE 91-49s assessment of Soviet nuclear capabilities in 1953). This attack was based on a

survive, albeit at reduced capacity, and about 70 percent of U.S. strategic bombers would be available for a counteroffensive. Anderson argued the aggregate impact of these damages would not be sufficient to defeat the United States; after absorbing the attack, "as a nation, the United States will retain the will to continue the war."

NSC is open to the idea of victory as U.S. and Soviet nuclear capabilities grow

By the time the results of the Harmon and Hull studies percolated through Truman's defense establishment, the first successful Soviet test of a nuclear device had made an attack on U.S. soil and a U.S.-Soviet nuclear exchange more distinct possibilities.[71] Prior to this point the mechanics of a Soviet nuclear strike had not received much scrutiny, in part because of the poor quality of U.S. intelligence on Soviet capabilities.[72] Estimates in the late 1940s had basically gone as far as highlighting the limited range of modern Soviet bombers and the vulnerabilities of critical U.S. industrial nodes.[73] The questions of how much damage a future nuclear war could cause and how the U.S.-Soviet ratio of nuclear forces was likely to evolve became top priorities after it was clear that the United States faced competition in this domain. "Once the basic breakthrough had been made to an atomic arsenal," one historian observes, "it became crucial … to predict the size

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Soviet arsenal of 45 to 90 weapons in mid-1952, and enough TU-4 Bulls to drop these weapons on targets in the continental United States. The Air Force leadership's discussion of the performance characteristics of Soviet medium-range bombers suggests that they expected Soviet leaders (and military operators) to accept the need for one-way missions if the conflict scenario demanded it. See Burr (2007), ed., Document 3A, pp. 37-40.

[71] Soviet nuclear capabilities eventually replaced the mobilization base as the top priority target for U.S. war planners, though urban-industrial centers would still "take priority in timing." May et al (1981), pp. 133, 141; Friedberg (1982), p. 58; S. D. Sagan (1989), *Moving Targets: Nuclear Strategy and National Security* (Princeton, NJ: Princeton University Press), p. 20.

[72] The U.S. defense community had also been focused on the more immediate problem of the conditions under which a nuclear capability would embolden Soviet behavior.

[73] Richard Betts (1982), "Elusive Equivalence: the Political and Military Meaning of the Nuclear Balance," in Huntington, ed., pp. 114, 147; Betts (1987), p. 147; Burr (2012b), ed., EBB No. 403, Document 2, p. 84.

of the [Soviet] stockpile..."[74] The then-nascent intelligence community was quick to respond to this question in early 1950, and the prognosis was not encouraging.

According to Central Intelligence Agency (CIA) estimate ORE 91-49, the Soviet Union could have as many as 200 weapons by mid-1954 or 1955.[75] An attack of this size on U.S. soil, the CIA surmised, would suffice not only to cause over 10 million casualties and paralyze 30 to 50 percent of U.S. industrial capacity, but also to destroy U.S. offensive capabilities. In other words, within four years the Soviet Union could mount a strike that could be "decisive in knocking the US out of a war." Admittedly, ORE 91-49 probably overestimated Soviet Union capabilities. Many of the operational factors highlighted by the Harmon and Hull reports were not applied to the Soviet effort, not to mention the fact that Soviet delivery vehicles were lacking in both numbers and range. This did not detract from the key finding that the 1954-1955 timeframe would bring critical change to the U.S.-Soviet balance. For the U.S. policy community, the Soviet test marked the decline of the United States' relative position; within a

[74] Prados (1982), p. 21.

[75] This paragraph is based on Central Intelligence Agency (1950), *Estimate of the Effects of the Soviet Possession of the Atomic Bomb upon the Security of the United States and upon the Probabilities of Direct Soviet Military Action*, ORE 91-49, April 6, in Folder 5, Box 178, Central Intelligence Reports File, Intelligence File, PSF, HSTL, pp. 3-12. Specifically, the CIA predicted that the Soviet stockpile would grow in the following manner: by mid-1950, it would have 10-20 weapons; by mid-1951, 25-45; by mid-1952, 45-90; by mid-1953, 70-135; and by mid-1954, 120-200 (this last figure was admittedly less firm than the others). The data compiled by Kristensen and Norris (2013) on the actual Soviet stockpile suggest that ORE 91-49 was pretty close to accurate. Futhermore, estimates at this time did not foresee the actual delivery of these bombs to present a problem. The Soviet Union was presumed to have more than enough TU-4 Bulls in the future to drop these weapons on targets in the continental United States (on one-way missions, that is). These particular figures would become standard fixtures in reports and discussions about the Soviet threat for about a year or so. For example, Air Force intelligence cited these numbers at the annual commanders conference that April. Over the next two years, the Soviet threat described by major U.S. policy statements (e.g., NSC-68 and successor documents like NSC-114 and NSC-135) would also be rooted in ORE 91-49s figures.

few years a potentially decisive Soviet nuclear capability could even throw the U.S. advantage into doubt.

The loss of the U.S. nuclear monopoly galvanized the Truman Administration to consider the pace of Soviet changes to the bilateral balance and what the United States should do about it. At the behest of the president, a group of senior officials from the state and defense departments collaborated to produce NSC-68, the first major statement of U.S. national security objectives.[76] This report acknowledged that the current strategic situation was generally favorable.[77] The United States possessed overall military as well as atomic superiority, and the prospects for winning a war against the Soviet Union were not bad. Though NSC-68 argued an atomic offensive at the time could deliver a "serious" but not decisive blow against the Soviet Union, it kept open the possibility of eventual victory. Truman's top defense and security officials had decided that an effective nuclear attack could reduce Soviet capabilities enough "to give the United States the prospect of developing a general military superiority in a war of long duration."

[76] The NSC-68 effort was led by Paul Nitze, head of Policy Planning at the State Department. With equal representation from the Departments of Defense and State, this reassessment of U.S. national security strategy sought to expose civilian and military perspectives to one another and ultimately produce an integrated view of U.S. military power and strategic plans. "This study should bring about not only a greater understanding on our part of the strategic thinking of the military departments," Deputy Under Secretary of State Dean Rusk assured other officials, "but should also enable us to have a more direct effect on their thinking." The final draft was backed by the Joint Chiefs. See Steven L. Rearden (1984), *Volume I: The Formative Years, 1947-1950*, in Alfred Goldberg, ed., *History of the Office of the Secretary of Defense,* Office of the Secretary of Defense, Historical Office (Washington, DC: United States Government Printing Office), p. 522-532; Dean Rusk (1950), Memorandum, January 18, in *Foreign Relations of the United States* (hereafter cited as *FRUS*) 1950, Vol. I, National security affairs, foreign economic policy (Washington, D.C.: U.S. Government Printing Office, 1998), p. 139. James E. Webb (1950), Memorandum, March 30, in *FRUS* 1950, Vol. I, p. 210.

[77] Discussion of NSC-68 text comes from Executive Secretary of the National Security Council (1950), *United States Objectives and Programs for National Security*, NSC-68, April 14, in Folder 9, Box 180, NSC-Meetings File, Subject File, PSF, HSTL, primarily pp. 20, 37.

Like their counterparts at the CIA, this group warned that the strategic situation was not moving in a favorable direction. NSC-68 confirmed the significance of 1954, when the Soviet Union could have as many as 200 weapons. Because the authors had taken the poor accuracy of Soviet weapons into account, the portrayal of the Soviet threat for the United States itself was toned down. By 1954 the Soviet Union was expected to be able to deliver 100 bombs on target, an offensive that could cause serious but not unacceptable damage to U.S. territory. The date at which the Soviets could mount a "decisive" attack was pushed back indefinitely, depending on the pace at which the United States developed its defenses and early warning capabilities. But concerns persisted about the U.S. capabilities to win a war in Europe against the Soviet Union in 1954. Given the inferiority of the U.S. conventional presence in the European theater, officials worried that if the Soviet Union used its ever-improving nuclear capabilities to strike U.S. forces with little or no warning, defeat in the subsequent ground campaign was likely.

To address this increasingly troubling state of affairs, NSC-68 pointed to the sizable amount of untapped resources "upon which increased strength can be rapidly built with maximum efficiency and economy." Although the Soviet defense industrial complex was believed to be operating at full capacity, the U.S. war economy was not. Through the mobilization of its "superior" military potential, the United States could "wrest the initiative" from its adversary and reverse current trends. NSC-68 pushed for a "rapid and sustained build-up" of U.S. defense programs, the first of several that would take place over the course of the Cold War. Such an expansion would not only ensure the certainty of U.S. retaliation following a Soviet strike, but potentially also slow the waning of U.S. nuclear superiority.

Council guidance on the implementation of NSC-68 in late 1951 illustrates that as the prospective costs of a nuclear war mounted, there was agreement within the NSC that with the

right investments, the United States could tolerate such costs.[78] The U.S. edge was decreasing more rapidly than NSC-68 had anticipated; Soviet nuclear power could in fact reach a critical point by mid-1953, one year earlier than previously calculated. Though a Soviet attack was now expected to claim up to nine million American lives, a much higher estimate for 1951, the United States possessed the technical wherewithal to avoid the worst-case scenario. With adequate warning, civilian training, and passive defenses, the NSC projected losses could be driven down by at least 50 percent, potentially more. Civilian defenses could be especially advantageous, with the potential to shrink the size of an oncoming Soviet attack and prohibitively complicate Soviet war plans, at least temporarily. U.S. policy-makers thus saw ample opportunity to make a nuclear war more tolerable, and thereby rectify the strategic situation.

Thermonuclear weapons begin to change perceptions of the strategic situation

During Truman's last year in office, the destructive potential of war with the Soviet Union increased dramatically as U.S. policy-makers faced the prospect of conflict with thermonuclear weapons. For a few years the United States had been developing hydrogen bomb technology, which promised much higher explosive yields than current weapons, but it had taken some time for the military implications to come into view.[79] One of the first organizations to formally

[78] Discussion of this document comes from Executive Secretary of the National Security Council (1951), *United States Programs for National Security*, NSC-114/2, October 12, in Folder 7, Box 185, NSC-Meetings File, Subject File, PSF, HSTL, pp. 7-13. At the time the intelligence community was estimating that the Soviet stockpile in 1951 would total about 50 weapons; with yields of up to 100 kilotons, each weapon could potentially cause 175,000 casualties. Thus estimates of Soviet capabilities were starting to increase; 50 weapons in 1951 is more than the range of 25-45 weapons projected for 1951 by the CIA 18 months earlier.

[79] President Truman had formed a special committee in 1949 within the NSC to investigate the feasibility and advantages of developing thermonuclear weapons. The first U.S. test of a hydrogen bomb would occur on November 1, 1952, with the first Soviet thermonuclear test.

demonstrate the costs of thermonuclear war was the RAND Corporation, an independent organization founded a few years earlier to conduct operational research for the Air Force. In March 1952 a team of RAND analysts predicted that a nuclear exchange between the two states could cause as many as 35 million fatalities in the United States and 25 million deaths in the Soviet Union, an outcome tantamount to "national suicide for both sides."[80,81] This more than doubled the devastation expected by the most pessimistic assessments of U.S.-Soviet nuclear warfare at the time.

On the basis of these calculations, the RAND report made several important conclusions. First, in the thermonuclear age a position of nuclear superiority was no longer very meaningful or feasible. Even if U.S. forces were consistently larger and more effective than Soviet forces, "the significance of that advantage," the report predicted, was "bound to diminish rapidly in the future." Qualitative or quantitative improvements could not change this fact. Although there was considerable uncertainty about how the future nuclear balance would look, substantial arsenals on both sides would prevent any position of advantage from lasting very long. Second, there was little the United States could do to protect itself from an incoming attack. U.S. policy-makers had to "face and accept the fact that [no combination of defensive measures] can give us more than partial invulnerability." As a consequence, the most the United States could expect to achieve

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taking place three years later. For more on Truman's decision-making with respect to hydrogen bombs, see Rosenberg (1979).

[80] Discussion of this report comes from U.S. Air Force Project RAND (1952), *Implications of Large-Yield Nuclear Weapons,* Report R-237, July 10 in William Burr (2004a), ed., *"It Is Certain There Will be Many Firestorms": New Evidence on the Origins of Overkill* (Washington, DC: The National Security Archive), EBB No. 108, Document 1, pp. iii, 10-11, 13, 17-19.

[81] These figures assume the use of 25-megaton weapons. If both sides instead used 5-megaton weapons, the United States and Soviet Union would each lose 22 million citizens.

was "relative invulnerability" by stockpiling thermonuclear weapons "at the most rapid rate possible." Hopefully this would suffice to prevent conflict altogether.[82]

The escalating costs of waging nuclear war against the Soviet Union complicated the NSC's reappraisal of the strategic situation in the summer and fall of 1952. U.S. forces were still seen as superior to their Soviet counterparts, validating the notion that "we are now and will remain capable of doing greater damage to the Soviet Union with atomic bombs than the Soviet Union can do to the United States." There was also some entertainment of the idea that a breakthrough in strategic defenses could extend the period of U.S. primacy; for example, a senior State official discouraged the premature dismissal of defensive technologies that might "successfully challenge new offensive weapons." Ultimately, however, the realities of the strategic situation had made somewhat of an impression on members of the Council. Now that the United States and Soviet Union could soon deploy thermonuclear weapons, the relative size of each side's stockpile would not define the "controlling relationship in the atomic equation."[83] As a result, even though the United States was still outpacing the Soviet Union in terms of nuclear weapons and delivery vehicles, the U.S. homeland was not necessarily safe from nuclear attack. The NSC agreed that the United States could attempt to improve the quality of its

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[82] A few months later another RAND report acknowledged the reality of U.S. vulnerabilities in the thermonuclear age. It explored the added difficulties that thermonuclear weapons would pose for U.S. recovery efforts after an attack. While it may have been possible "to absorb a large number of A-bombs and recover, particularly if the targets selected are not optimal and bombing accuracy is poor," the report concluded, "we cannot stand fifty 25-MT bombs if they are well placed." Marc Trachtenberg (1991), *History and Strategy* (Princeton, NJ: Princeton University Press), p. 6.

[83] Executive Secretary of the National Security Council (1952), *Reappraisal of United States Objectives and Strategy for National Security*, Annex to NSC-135/1, August 22, in Folder 2, Box 187, NSC-Meetings File, Subject File, PSF, HSTL, pp. 27-29; Executive Secretary of the National Security Council (1952), *Reappraisal of United States Objectives and Strategy for National Security*, NSC-135/3, September 25, in Folder 9, Box 187, NSC-Meetings File, Subject File, PSF, HSTL, p. 15.

defenses, but such measures would not "prevent the probable attainment of a Soviet capability to damage critically the United States." For this reason, a "substantial degree of vulnerability" of both the U.S. population and U.S. nuclear forces had to be accepted. Shifting away from previous convictions about winning a nuclear war, NSC statements on national security objectives now began to point out that U.S. and Soviet capabilities could "place the ultimate victory of the other in grave doubt."

As Truman's tenure came to a close, the ideas underlying RAND's arguments may have been on the minds of national security officials. By early 1953, even as the defense build-up advocated by NSC-68 was bearing fruit, some of those most familiar with the state of the balance were still uneasy about the longevity of the U.S. position.[84] This view was apparent in a memorandum from Paul Nitze, the head of policy planning at the Department of State (and director of the NSC-68 effort), to Secretary Dean Acheson days before the incoming Eisenhower Administration took over. [85] Fresh from finishing a report with the Department of Defense on the status of U.S. national security programs, Nitze was particularly unsettled about the nuclear balance. "The report raises a doubt whether our net capability to injure the Soviet Union is increasing," wrote the senior State official, or whether "the increasing defensive capability of the Soviet Union may be offsetting our increasing offensive capability." Even after an extraordinary boost, U.S. nuclear capabilities could not diminish the concern that the United States was losing its nuclear edge.

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[84] Trachtenberg (1988/1989), p. 6, 28; *History of the Strategic Arms Competition*, p. 152. According to NSC-135/1, by late 1952 the U.S. production of military items was five to six times greater than that of June 1950. See Executive Secretary of the National Security Council (1952), *Reappraisal of United States Objectives and Strategy for National Security*, Annex to NSC-135/1, August 22, in Folder 2, Box 187, NSC-Meetings File, Subject File, PSF, HSTL, p. 22.
[85] Memorandum by the Director of the Policy Planning Staff (Nitze) to the Secretary of State (1953), January 12, *FRUS* 1952-1954, Vol. II, Part 1, National Security Affairs, pp. 202-203.

The Truman Administration and mutual vulnerability: concluding thoughts

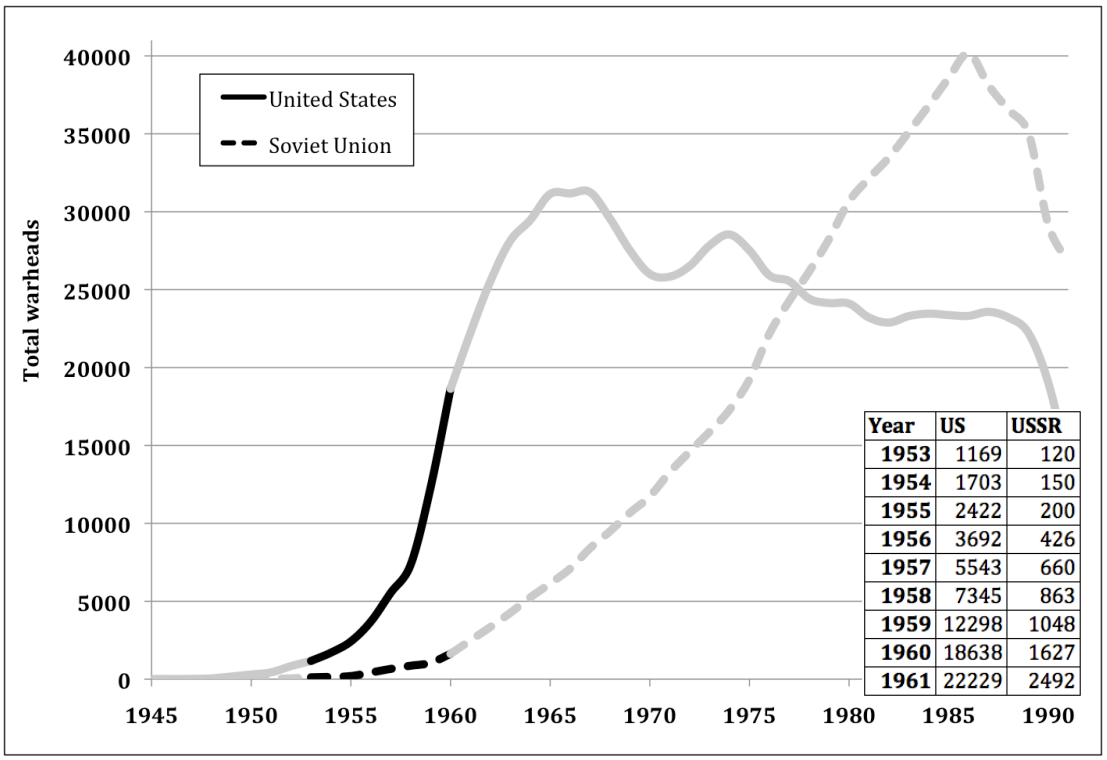
The evolution of U.S. national security objectives for the first couple of years after a nuclear balance materialized in 1949 suggests that Truman officials did not believe the new relationship of mutual vulnerability between the United States and Soviet Union was a permanent one. For the most part the population losses and industrial paralysis the United States could suffer on account of a nuclear war were admittedly horrific consequences, but manageable ones. Major strategy documents acknowledged the level of damage a Soviet strike could exact against U.S. targets and vice versa, but went on to conclude that winning the war remained a realistic prospect. Looking ahead, the strategic circumstances were perceived not as robust but as highly changeable. Quantitative and qualitative improvements in U.S. strategic technology could reclaim the declining U.S. relative position; indeed, this was the primary aim of the national security strategy laid out by NSC-68.

This analysis suggests that nuclear war was seen as acceptable through 1951 for at least two reasons. First, the casualties anticipated by strategic assessments were on the order of a few million people, a tally of devastation that was actually lower than what some countries had suffered during World War II, which had ended only a few years earlier. What's more, that was the worst-case scenario; most of the damage was expected to occur in Europe, where a war with the Soviet Union was likely to play out. Second, a bureaucratic actor with a large degree of power and influence, the SAC, was highly confident about their ability to defeat the Soviet Union, and vocal about it. With Soviet capabilities still relatively modest and the operators of the U.S. nuclear offensive so optimistic, it may have been easier to believe that under the right circumstances, victory at acceptable cost was achievable.

The tolerability of nuclear war began to change around 1952 primarily because conflict between the superpowers would soon involve weapons with much higher yields; that year the United States successfully tested its first hydrogen bomb, and the Soviet Union would follow suit in 1954.[86] Assessments of thermonuclear conflict by the RAND Corporation pointed to a markedly higher degree of destruction, with casualties of over 30 million people. Even if Soviet nuclear forces could be blunted, the detonation of just a few weapons on U.S. territory could now cause much more damage than before. As a consequence, U.S. policy officials began to face the reality that they could not protect the populace from an incoming nuclear strike, acknowledging as much in the NSC's reappraisal of NSC-68 in 1952. Thermonuclear weapons also called into question the attainability and meaning of superiority, a position that the United States had held for the previous seven years and was now losing. This was made evident by persistent doubts about the U.S. position in the "atomic equation," even after the extraordinary expansion called for by NSC-68. Though U.S. policy-makers had not accepted the inescapability of U.S.-Soviet mutual vulnerability by end the Truman Administration, there was a greater appreciation of how difficult it might be to redress the nuclear balance.

[86] By early 1953 the CIA was reporting that Soviet thermonuclear tests could be possible by mid-1954. See Central Intelligence Agency (1953), SE-36: *Soviet Capabilities for Attack on the US Through Mid-1955*, March 5, CIA Historical Review Program, Freedom of Information Act Electronic Reading Room, paragraph 4.

Chapter 3: Mutual vulnerability during the Eisenhower Administration



Year	US	USSR
1953	1169	120
1954	1703	150
1955	2422	200
1956	3692	426
1957	5543	660
1958	7345	863
1959	12298	1048
1960	18638	1627
1961	22229	2492

Figure 2. U.S. and Soviet warhead levels during the Eisenhower Administration[87]

Under President Dwight D. Eisenhower the vulnerability of the United States to large-scale nuclear attack slowly began to approach what Soviet leaders had been living with for several years. From about the mid-1950s Soviet bombers were capable of reaching the continental United States on two-way missions thanks to the advancement of in-flight refueling technology.[88] This development put targets on U.S. territory at greater certainty of destruction by Soviet attack, though the size of the Soviet long-range attacking force remained modest. From a technical standpoint, the large quantitative disparity between U.S. and Soviet forces through the

[87] Kristensen and Norris (2013), pp. 81-82.
[88] May et al (1981), p. 317.

1950s kept open the possibility (though a decreasingly plausible one) that the United States might be able to destroy Soviet retaliatory assets. The Soviet Union tested its first ICBM in 1957, but neither state would deploy these delivery vehicles for another few years. Thus during Eisenhower's tenure it remained questionable whether all conceivable conflict scenarios would definitely result in the Soviet Union causing "unacceptable damage" to U.S. society, economy and military capabilities. Though both superpowers were exposed to the risk of extraordinary nuclear attack by the other, the United States could have potentially reduced its risk under highly favorable attack conditions; the Soviet Union did not have the same option.

For the first few years of Eisenhower's presidency, mutual vulnerability from which there was no escape was not an observable component of the material backdrop against which officials formulated national security strategy. As shown below in Table 3, evaluations of nuclear war's effects conducted in 1953 and 1954 – yet to incorporate the deployment of thermonuclear weapons or ballistic missiles – depicted an outcome that was manageable, tantamount to less than ten million U.S. deaths. There was general consensus at high levels that at least in the near term, the Soviet Union could not yet deal a "crippling blow" against the United States, especially if a robust system of passive defenses was put in place. Though policy actors expected progressing Soviet capabilities to soon give rise to a strategic stalemate, this condition was anticipated to be delicate and fleeting. To slow or redress the declining U.S. position, officials urged the development of breakthrough technologies.

Table 3. Major strategic assessments during the Eisenhower Administration[89]

Assessment	**U.S. fatalities (millions)**	**Soviet fatalities (millions)**
NESC (1953)	4.5 - 6.3	Unavailable
NESC (1954)	3.1 – 9.6	Unavailable
WSEG R-12 (1955)	N/A	60
NESC (1955)	114	Unavailable
NESC (1956)	71	Unavailable
NESC (1957)	46 - 95	81
NESC (1958)	50	114
NESC (1959)	62 - 82	Unavailable
NESC (1960)	61	99

In the mid-1950s, the level of damage projected to accompany a nuclear war ballooned. As detailed above, from 1955 exchange models would demonstrate to policy-makers that global nuclear war would result in an average loss of about 70 million U.S. lives (e.g., roughly 40 percent of the population in the late 1950s). It was around this time that perceptions of the balance among Eisenhower officials split into two opposing camps. One group seemed to recognize the resilience of the long-term balance, and put forth arguments that extended some of the observations made late in the Truman Administration. The nature of the evolving strategic situation suggested that it would be impossible to definitively solve the problems presented by a nuclear stalemate. In the interest of stability the United States would be better off maintaining a modest but secure second-strike capability. This cohort was composed of notable figures like the national security advisor, secretary of state, chief of naval operations, and at times, the president himself. Though this group's commentary implied acceptance of the inescapability of mutual

[89] All source material used by this dissertation is either unclassified or declassified. The figures in this table are derived from minutes of report briefings and accounts by observers, including the president's diary. Population losses calculated by the 1955 and 1956 NESC reports are approximate since the official numbers are still classified.

vulnerability, they never argued for the force posture necessitated by the condition in a unified or coherent fashion.

To others, primarily at the DOD and within the JCS, the nature of the emergent strategic situation was less indelible. As the toll that a future nuclear conflict would take on the United States reached proportions that were difficult to fathom, this group sought ways to lessen the intensity of nuclear war. Despite strategic assessment conclusions that factors like strategic warning and targeting mix offered limited returns, these policy actors continued to support the objective of winning even if such an outcome meant the loss of tens of millions of Americans. As the Eisenhower Administration ended, this group had positioned the United States to attempt to escape the condition through investments in large numbers of ballistic missiles and both active and passive defenses.

Initial optimism about winning a nuclear war and overturning the future stalemate

For the first few years of Eisenhower's tenure, the possibility that U.S.-Soviet mutual vulnerability was inescapable was absent from the official mindset. In part this can be chalked up to strategic assessments early on in the administration, which considered the U.S. ability to absorb a Soviet offensive to be practically undeniable. Throughout the 1950s these evaluations were typically conducted by the newly created Net Evaluation Subcommittee (NESC), an analytical subsidiary of the NSC that would go on to produce increasingly sophisticated models of U.S.-Soviet nuclear war each year.[90] The group's first two reports drew conclusions about the

[90] Technically this group would not be known as the NESC until 1955. For bureaucratic reasons it was called the Special Evaluation Subcommittee (SES) in 1953 and the Net Capabilities Evaluation Subcommittee (NCES) in 1954. The NESC was active for about ten years, and then was disbanded by President Johnson in 1964 largely at the behest of the Secretary of Defense, Robert McNamara. See Memorandum From the Secretary of Defense (McNamara) to the

effects of a Soviet nuclear offensive through 1957 that were similar to the bulk of Truman-era assessments.[91] An attack over the next four years was expected to kill between four million and ten million Americans and paralyze up to two-thirds of U.S. industry, but some of these costs could be eliminated if certain defensive measures were taken. The subcommittee exhibited considerable confidence in passive defenses, repeating that a combination of tactical warning and evacuation measures could potentially halve prospective casualties.[92,93] Crucially the assessments had yet to incorporate ballistic missiles, defenses against which were far more formidable than

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Secretary of State, et al (1964), Memorandum for the President on the Elimination of the Net Evaluation Subcommittee of the National Security Council, December 23, in William Burr (2014), ed., *Studies by Once Top Secret Government Entity Portrayed Terrible Costs of Nuclear War* (Washington, DC: The National Security Archive), EBB No. 480, Document 12C. For views on the matter from the JCS and State Department, see Memorandum From the Chairman of the Joint Chiefs of Staff (Wheeler) to the Secretary of Defense (McNamara) (1965), Revision of the NESC Charter (U), January 23, in Folder 327, Box 6, National Security Action Memorandums, National Security File, Papers of Lyndon Baines Johnson, Lyndon Baines Johnson Library, Austin, Texas (hereafter cited as LBJL); Memorandum From the Acting Secretary of State (Ball) to the Secretary of Defense (McNamara) (1965), January 28, in Folder 327, Box 6, National Security Action Memorandums, National Security File, Papers of Lyndon Baines Johnson, LBJL.

[91] Discussion of 1953 SES report is derived from NSC 140/1 (1953), *A Report to the National Security Council by the Special Evaluation Subcommittee of the NSC on Summary Evaluation of the Net Capability of the USSR to Inflict Direct Injury on the United States up to July 1, 1955,* May 18, in Net Evaluation Subcommittee (1), Box 37, Disaster File, White House Office, National Security Council Staff: Papers, 1948-1961, DDEL. Discussion of the 1954 NCES report comes from *Report of the Net Capabilities Evaluation Subcommittee* (1954)*,* November 3, in Net Evaluation Subcommittee (3), Box 37, Disaster File, White House Office, National Security Council Staff: Papers, 1948-1961, DDEL.

[92] Strategic defenses can be thought of as two types, generally depending on whether they are engaged before or after an enemy weapon reaches its target. *Active* defenses are intended to intercept an attack before it arrives, while *passive* measures are typically designed to protect against the attack's effects after it has occurred.

[93] Indeed, during the 1953 report briefing the president maintained that "very great advantages…would accrue to our defenses if we really could count on two hours of warning"; Memorandum of Discussion at the 148th Meeting of the National Security Council (1953), June 4, in Paul Kesaris, ed. (1981), *Documents of the National Security Council: First Supplement* (Frederick, MD: University Publications of America), p. 5.

those aimed at countering strategic bombers.[94] Ultimately the NESC judged that the anticipated losses would do little to prevent the United States from countering heavily and winning the subsequent war.[95]

Early discussions within the government suggest that nuclear war outcomes in the near term were anticipated to favor the United States over the Soviet Union. The NSC's inaugural statement on Basic National Security Policy (BNSP) in 1953 acknowledged that while Soviet nuclear forces were improving, they were could not yet inflict a "crippling blow" against the United States.[96] To protect against this eventuality the paper recommended defenses for the mobilization base, which could not offer a complete shield against Soviet retaliation but could impact the severity of its effects. The 1955 Killian Report, produced by a group of scientific experts with the Office of Defense Mobilization (ODM), explored how technological resources

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[94] U.S. policy documents would not exhibit the same level of confidence in the ballistic missile age. For example, according to U.S. continental defense policy in 1953, "sometime after 1960, due to the possible development of long range air-to-ground or ground-to-ground guided missiles, there can be no assurance that the proposed (defensive) programs will give the high degree of protection required." Report to the National Security Council by the Executive Secretary (Lay) (1953), NSC 159/4 (Continental Defense), September 25, *FRUS* 1952-1954, Vol. II, Part 1, National Security Affairs, p. 478. The same sentiment can be observed in future iterations of this document. See Report to the National Security Council by the National Security Council Planning Board (1954), NSC 5408 (Continental Defense), February 11, *FRUS* 1952-1954, Vol. II, Part 1, National Security Affairs, p. 614; National Security Council (1955)*, NSC 5501: Basic National Security Policy*, January 6, in NSC 5501 – Basic National Security Policy, Box 14, NSC Series, Policy Papers Subseries, White House Office, Office of the Special Assistant for National Security Affairs: Records, 1952-1961, DDEL, p. 1

[95] Memorandum of Discussion at the 148th Meeting of the National Security Council (1953), pp. 4-6.

[96] Report to the National Security Council by the Executive Secretary (Lay) (1953), NSC 162/2 (Basic National Security Policy), October 30, *FRUS* 1952-1954, Vol. II, Part 1, National Security Affairs, pp. 577-597, especially p. 579. "Crippling" damage tended to be defined as a "degree of destruction, disruption and loss of life that, while not decisive, would raise serious question as to the ability of the US to recover and regain its status as a great industrial nation for a considerable period of years." National Security Council (1956), NSC 5602: Basic National Security Policy, February 8, in NSC 5602/1 – Basic National Security Policy, Box 17, NSC Series, Policy Papers Subseries, White House Office, Office of the Special Assistant for National Security Affairs: Records, 1952-1961, DDEL, p. 31.

could be harnessed to decrease U.S. vulnerability to surprise attack.[97] According to this group of experts, for the next few years a U.S. strike could be decisive, either by destroying Soviet nuclear forces, bringing "civil, political, and cultural life…to a condition of chaos," or both. Although the United States could not avoid severe destruction, the Killian Committee predicted it would still "emerge a battered victor" even if the Soviets struck first.

Debate over U.S. nuclear war objectives at this time highlight that at the highest levels of government the costs the United States could impose on the Soviet Union were prioritized over the reciprocal toll on home territory. As far as the president was concerned, his assessment of nuclear options in the event of conflict

> … would be based on his judgment of just how much such a war plan would hurt the enemy. For the time being, at least, no other considerations would be of significance. This, of course, did not mean that he would exclude from his judgment the question of how much harm or hurt the United States itself would suffer as a result of the methods chosen to prosecute the war. It was quite appropriate to keep this consideration in mind. The President concluded by admitting that his point of view might seem brutal...[98]

Eisenhower had thus resigned himself to the fact that the United States would suffer tremendously if nuclear war should come to pass, but that such costs would have to be endured. The 1955 BNSP affirmed this sentiment by promising that even after a crippling attack the

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[97] *Report to the President by the Technological Capabilities Panel of the Science of the Science Advisory Committee: Volume I* (1955)*,* February 14, in Technological Capabilities Panel of the Science Advisory Committee, Report to the President by (1), Box 11, NSC Series, Subject Series, White House Office, Office of the Special Assistant for National Security Affairs: Records, 1952-1961, DDEL, pp. 10-13.

[98] Memorandum of Discussion at the 190th Meeting of the National Security Council (1954), March 25, in Kesaris (1981).

United States would "still be able to inflict equal or greater damage on the USSR."[99] Nuclear war was conceptualized as the unfortunate, unavoidable byproduct of the least unacceptable outcome.

Looking ahead, Eisenhower officials saw Soviet nuclear forces improving but believed the United States would have no trouble tilting the balance back to its advantage.[100] Policy actors acknowledged that a U.S.-Soviet "stalemate" in destructive capabilities was approaching, but expected such a condition to be temporary phase that the United States could overcome. In an era of rapid technological development," the intelligence community observed in 1955, "it is always possible that a condition of nuclear stalemate may prove transitory."[101] The Killian Committee did not expect the U.S.-Soviet competition to stay deadlocked for long, noting, "we need not assume that this state is unchangeable or that one country or the other cannot move again into a position of relative advantage." [102] This transitory notion of stalemate came down to confidence in the power of technology to overturn the balance. To slow or redress the decline of the U.S. position a draft of the 1954 BNSP advocated a "sustained effort … to invent and develop capabilities which will provide decisive preponderance to U.S. power."[103] The Killian report urged the United States to "push all promising technological development" in order to stave off

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[99] National Security Council (1955)*, NSC 5501: Basic National Security Policy*, January 6, in NSC 5501 - Basic National Security Policy, Box 14, NSC Series, Policy Papers Subseries, White House Office, Office of the Special Assistant for National Security Affairs: Records, 1952-1961, DDEL, pp. 1-2.

[100] Study Prepared by the National Security Planning Board, (1954), Tentative Guidelines under NSC 162/2 for FY 1956, June 14, *FRUS* 1952-1954, Vol. II, Part 1, National Security Affairs, pp. 647-680.

[101] National Intelligence Estimate 100-7-55 (1955), November 1, *FRUS* 1955-1957, Vol. XIX, National Security Policy, Document 39, pp. 134-135.

[102] Discussion of this report comes from *Report to the President by the Technological Capabilities Panel of the Science of the Science Advisory Committee: Volume I* (1955)*,* February 14, in Technological Capabilities Panel of the Science Advisory Committee, Report to the President by (1), Box 11, NSC Series, Subject Series, White House Office, Office of the Special Assistant for National Security Affairs: Records, 1952-1961, DDEL, pp. 10-13.

[103] Granted, this particular text did not make it into the next official iteration of the BNSP, but it illustrates an important viewpoint discussed during the process.

stalemate for as long as possible or "escape from it" altogether. This portrayal of the future balance as fleeting and so sensitive to technological change strongly suggests that Eisenhower officials did not believe mutual vulnerability would endure.[104]

Ballooning damage associated with nuclear war raises doubts among senior leadership

Starting in the mid-1950s, strategic assessments of nuclear war – now expected to be waged with larger arsenals and thermonuclear weapons – began to forecast markedly higher levels of destruction, a trend that the RAND Corporation had alluded to several years earlier. The WSEG calculated that a U.S. attack in 1955 could result in upwards of 60 million Soviet bloc fatalities and virtually eliminate Soviet industrial capacity for at least one year.[105] NESC reports on nuclear exchanges taking place in the late 1950s forecasted similar outcomes for both superpowers.[106] They found that United States could lose from 25 percent to 65 percent of the

[104] The Gaither Committee's predictions about the long-term balance demonstrate that this view persisted for several years. According to this group, an "extremely unstable equilibrium" would characterize the reciprocal deployment of second-generation missiles with megaton warheads. A cycle of action and reaction would persist, with "no end to the technical moves and counter-moves" and any major change in U.S. or Soviet forces giving "either nation the ability to come near to annihilating the other." In other words, by 1957 the future strategic environment was still not seen as resilient. Discussion of this aspect of the Gaither Report is from National Security Council (1957), *NSC 5724: Report to the President by the Security Resources Panel of the ODM Science Advisory Committee on Deterrence and Survival in the Nuclear Age*, November 7, *FRUS* 1955-1957, Vol. XIX, National Security Policy, Document 158, pp. 650-653.

[105] The WSEG was an analytical sub-body of the JCS stood up in 1948 with the directive of providing objective research on weapons-related issues for the Chiefs and Secretary of Defense. Discussion of this February 1955 report (WSEG R-12, *An Evaluation of the Combined Effects of the US Atomic Objectives for a War Beginning in Mid-1955*) is from David Alan Rosenberg and W.B. Moore (1981), "'Smoking Radiating Ruin at the End of Two House': Documents on American Plans for Nuclear War with the Soviet Union, 1954-1955," *International Security*, Volume 6, Number 3, pp. 29-38.

[106] On account of the redundancy of the subcommittee's findings in 1955, 1956 and 1957, the director of the NESC, General Thomas, actually wanted to modify the group's 1958 analysis. The past three studies had all demonstrated that "the Soviets have the capability to inflict extreme damage to the CONUS under any of the combinations of variations considered."

U.S. population (about 50 million to 100 million people), from 60 percent to 90 percent of industrial capacity, and much of the civilian and military leadership.[107] The Soviets would suffer comparably; over one-half of the population, government and economy would be eliminated. To the president's astonishment the subcommittee also found that these results held regardless of the amount of warning that leaders had before an attack.[108,109] Changes in target preferences also had

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Memorandum From the Chairman of Joint Chiefs of Staff (Twining) to General Thomas (1957), October 7, Digital National Security Archive, Collection on Nuclear History.

[107] This paragraph is based on the NESC reports from 1955, 1956 and 1957. The first two reports are still classified, but details about their findings can be derived from sources like minutes from the report briefings and accounts by observers, including the president's diary. Memorandum of Discussion at the 263rd Meeting of the National Security Council (1955), October 27, *U.S. Declassified Documents Online*, pp. 9-13; Memorandum on the Net Evaluation Subcommittee Report (1955), October 31, in Box 13, Executive Secretary's Subject File Series, White House Office, National Security Council Staff: Papers, 1948-1961, DDEL; Diary Entry by the President (1956), January 23, *FRUS* 1955-1957, Vol. XIX, National Security Policy, Document 53, pp. 187-191. Memorandum of Discussion at the 306th Meeting of the National Security Council (1956), December 20, *FRUS* 1955-1957, Vol. XIX, National Security Policy, Document 100, pp. 379-381. Discussion of the subcommittee's findings in 1957 comes from the report itself and its presentation to the Council. *Report of the Net Capabilities Evaluation Subcommittee* (1957), November 15, 1957 Report of the Net Evaluation Subcommittee, NSC [examination of effects of Soviet nuclear attacks on the U.S.], Box 1, Intelligence Files, U.S. National Security Council Presidential Records, DDEL; Memorandum of Discussion at the 344th Meeting of the National Security Council (1957), November 12, *FRUS* 1955-1957, Vol. XIX, National Security Policy, Document 162.

[108] Specifically, the reports compared two types of Soviet offensives, each followed by a U.S. counterattack. In one scenario, U.S. leaders were given "tactical warning," advance notice that was essentially governed by the effectiveness of the U.S. early warning system. The other case assumed U.S. leaders would receive "strategic warning" of a Soviet attack on the order of one month. The results indicated that there was little appreciable difference in the magnitude of losses between the two scenarios. The extra (passive) defensive measures that strategic warning permitted the United States to muster were unhelpful against the heavier attacks the Soviet Union could muster during the extra time available.

[109] Notes on the NESC briefing in 1956 and 1957 highlight the president's amazement that strategic warning (and thus having U.S. forces fully alerted) did not reduce the amount of damage incurred by the United States. Memorandum for the Record by the President's Special Assistant for National Security Affairs (Anderson) (1956), January 23, The Repetition of the Net Evaluation Subcommittee Briefing Before the President, the Secretary of State, the Secretary of Defense, and the Chairman of the Atomic Energy Commission, *FRUS* 1955-1957, Vol. XIX, National Security Policy, Document 54; Memorandum of Discussion at the 344th Meeting of the

little influence on the outcome; Soviet attacks on military sites and a composite protocol including civilian targets offered similar prognoses.

Though these calculations did not exactly portray victory as a low-cost endeavor, they did argue that the United States could limit damage to home territory. Keeping with its previous reports, but contrasting with the WSEG, the NESC continued to assert the potential of passive defenses, with the 1957 report finding that a national shelter program might bring U.S. casualty numbers down by at least 35 percent. Around the same time a panel appointed by the president lent additional weight to the promise of defenses.[110] According to this group, known as the Gaither Committee, to rectify the deteriorating strategic landscape the U.S. posture needed a tremendous boost in passive measures. The report proposed a costly nationwide shelter program, alleging that it could save up to 50 million lives in the event of an attack.[111] This possibility was especially appealing given the shortened window of decision-making time implied by the looming deployment of ballistic missiles.

In light of nuclear war's mounting costs, the promise of strategic defenses was not enough for some policy actors. Between 1955 and 1958 a somewhat disparate but important

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National Security Council (1957), November 12, *FRUS* 1955-1957, Vol. XIX, National Security Policy, Document 162.

[110] National Security Council (1957), *NSC 5724: Report to the President by the Security Resources Panel of the ODM Science Advisory Committee on Deterrence and Survival in the Nuclear Age*, November 7, *FRUS* 1955-1957, Vol. XIX, National Security Policy, Document 158, pp. 650-653. Notable contemporary accounts of the Gaither Report and its reception can be found in Memorandum From the Special Assistant to the President for National Security Affairs (Cutler) to the Executive Secretary of the National Security Council (Lay) (1958), May 31, in Foster, William C. [May-July 1958] (1), Box 13, Alpha Subseries, Subject Series, White House Office, Office of the Staff Secretary: Records, 1952-1961, DDEL; Editorial Note, *FRUS* 1955-1957, Vol. XIX, National Security Policy, Document 155. For historical treatments of the study see Prados (1982), pp. 67-75; May et al (1981), pp. 226-228, 411-413.

[111] The program was estimated to cost around $22 billion, which is quite high considering that the entire 1958 defense budget totaled around $40 billion. Memorandum of Discussion at the 351st Meeting of the National Security Council (1958), January 16, *FRUS* 1958-1960, Vol. III, National Security Policy, Arms Control and Disarmament, Document 4, p. 10.

group of officials began to push back against the idea that nuclear war was acceptable and that the United States could build its way out of an increasingly thorny strategic environment. The most significant of these figures was President Eisenhower. Though he had endorsed the objective of fighting a nuclear war, the devastation depicted by strategic assessment was chipping away at the feasibility of such plans. During a meeting with his military advisors in the wake of the 1955 NESC study, Eisenhower wondered how it would be possible for the United States to "fight a war after the amount of devastation shown in that report, or even a small fraction of that amount, had occurred."[112] He came away from the next year's NESC briefing convinced that the "magnitude and gravity of the problems covered in the study…warranted taking a look at the whole matter in terms of determining how much destruction the U.S. and its people can absorb and survive."[113] Finally, the president acknowledged that the expansion of U.S. nuclear forces may not have constituted a long-term solution. "If we do not now have enough military strength to deter the Soviet Union from nuclear attack," Eisenhower lamented at a meeting one day after receiving the 1956 NESC report, he "could not be sure that 20 times as much military strength would succeed in deterring the Soviets."[114] For the president, the relentlessness of the mutually vulnerable balance seemed perceptible.

It took another two years for this view to gain ground among others. By this time, the Soviet Union had successfully used an ICBM to launch a satellite called Sputnik into orbit. Since the U.S. defense establishment had yet to master the underlying technology, the achievement

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[112] Memorandum for the Record, Conference of Joint Chiefs of Staff with the President (1956), February 10, Digital National Security Archive, Collection on Nuclear History.
[113] Memorandum of Discussion at the 306th Meeting of the National Security Council (1956), December 20, *U.S. Declassified Documents Online*, p. 4.
[114] Memorandum of Discussion at the 307th Meeting of the National Security Council (1956), December 21, *FRUS* 1955-1957, Vol. XIX, National Security Policy, Document 101, p. 390.

indicated to many that the United States was falling behind.[115] It was around this point that certain civilian and military officials started to acknowledge the strategic situation as permanent. One of the highest-level subscribers to the idea that an enduring stalemate was on the horizon was Eisenhower's national security advisor, Robert Cutler. Cutler was keenly interested in whether a permanent answer to the problems presented by a stalemate was possible.[116] Robert Bowie, who had recently left his position as Assistant Secretary of State for Policy Planning, summarized this perspective quite well. "Those who think we can keep ahead of the Soviet Union militarily are deluding themselves," he told Cutler. [117] With no "quick solution" to a strategic situation that could persist for decades, Bowie thought the United States "should be ready to slough off anything beyond what is necessary to constitute an adequate deterrent," focusing "only the minimum essential."[118]

Shortly thereafter, Cutler disclosed this take on national security strategy with several top officials, including the Secretary of State, John Foster Dulles. "The U.S. should determine,

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[115] By accelerating the perceived pace of the Soviet ICBM program, Sputnik had a pronounced impact on public, official and intelligence estimates of the U.S. Soviet strategic situation. May et al (1981), pp. 395, 398, 409. For an overview of the impact of Sputnik on U.S. policy, see pp. 395-416. The United States would successfully test its first ICBM (at full range) one year later, in November 1958.

[116] Memorandum From Assistant Deputy Director of the Office of Defense Mobilization (Finley) to the Special Assistant to the President for National Security Affairs (Cutler) (1958), Notes on Meeting of Planning Board with Consultants on March 7, 1958, March 17, in Basic National Security Policy, Box 11, Special Assistant Series, Subject Subseries, White House Office, Office of the Special Assistant for National Security Affairs: Records, 1952-1961, DDEL.

[117] Memorandum From Assistant Deputy Director of the Office of Defense Mobilization (Finley) to the Special Assistant to the President for National Security Affairs (Cutler) (1958), Notes on Meeting of Planning Board with Consultants on March 7, 1958, March 17, in Basic National Security Policy, Box 11, Special Assistant Series, Subject Subseries, White House Office, Office of the Special Assistant for National Security Affairs: Records, 1952-1961, DDEL.

[118] Memorandum From Assistant Deputy Director of the Office of Defense Mobilization (Finley) to the Special Assistant to the President for National Security Affairs (Cutler) (1958), Notes on Meeting of Planning Board with Consultants on March 7, 1958, March 17, in Basic National Security Policy, Box 11, Special Assistant Series, Subject Subseries, White House Office, Office of the Special Assistant for National Security Affairs: Records, 1952-1961, DDEL.

establish, and maintain the minimum invulnerable strategic forces adequate to deter initiation of all-out war by a rational opponent," the national security advisor recommended.[119] Challenging the bureaucratic interests of the military services, he argued further that seeking to acquire he ability to destroy thousands of military targets or comprehensive defenses were futile goals. For Cutler, investing in anything beyond secure second-strike capabilities was a dangerous proposition, since excessive force levels could "appear to be a warlike act."

The Secretary of State shared Cutler's view that the evolving balance challenged the current premise of U.S. deterrent strategy towards the Soviet Union, which urged the development of capabilities that promised to win a nuclear war.[120] "The time would soon be coming—if, indeed, it was not already here," remarked Dulles at a meeting on national security policy in late 1958, "when we may have to take another hard look at this question of U.S. military superiority over the Soviet Union."[121] When it came to what the United States could accomplish in conflict, Dulles doubted that "you could have a nuclear war in which a 'victory' could be achieved."[122] It was clear that several high-level officials were pessimistic about U.S. superiority in the post-conflict space.

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[119] Letter From the President's Special Assistant for National Security Affairs (Cutler) to Secretary of State Dulles (1958), April 7, in Nuclear Policy, Box 14, NSC Series, Briefing Notes Subseries, White House Office, Office of the Special Assistant for National Security Affairs: Records, 1952-1961, DDEL.

[120] Secretary Dulles had misgivings about U.S. war objectives for some time, particular in light of the possibility of limited war, and had expressed these concerns to Eisenhower. For example see Editorial Note, *FRUS* 1958-1960, Vol. III, National Security Policy, Arms Control and Disarmament, Document 14. Memorandum of Discussion at the 394th Meeting of the National Security Council (1959), January 22, *FRUS* 1958-1960, Vol. III, National Security Policy, Arms Control and Disarmament, Document 47.

[121] Memorandum of Discussion at the 348th Meeting of the National Security Council (1958), October 30, *FRUS* 1958-1960, Vol. III, National Security Policy, Arms Control and Disarmament, Document 36.

[122] Ultimately the Council deferred on this point, stipulating that the United States would decide the most appropriate objective in light of the circumstances at the time. National Security

Another entity that was particularly moved by the core of Cutler's arguments was the office of the Chief of Naval Operations (CNO), Admiral Raleigh A. Burke.[123] The likely military trends over the next decade suggested to this group that the United States needed a different strategic concept to address the Soviet threat if the country wanted to avoid an indefinite arms competition.[124] To inhibit arms race incentives the CNO believed the United States had to seek limited, instead of total, invulnerability. As a result the CNO recommended relying on a small number of mobile weapons systems like strategic submarines, which were easier to conceal than missiles and bombers. Burke would go on to elaborate this concept, advocating a "finite deterrent" alternative to the defense posture then being pitched by the Gaither Report.[125]

Escape from the strategic situation remains the premise of U.S. policy

Though the durability of the future U.S.-Soviet balance was accepted by some, this idea garnered less regard at the DOD and within the JCS, especially as concerns about a "missile gap" favoring

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Council (1959)*, NSC 5904/1 – US Policy in Event of War*, March 17, in NSC 5904/1 – US Policy in Event of War, Box 26, NSC Series, Policy Papers Subseries, White House Office, Office of the Special Assistant for National Security Affairs: Records, 1952-1961, DDEL.

[123] A memorandum from an aide to Cutler describes the Navy's development of the idea of a finite deterrence as the "culmination of intensive efforts since (Culver) injected this basic idea at high levels." Memorandum From Captain Jack Morse to the President's Special Assistant for National Security Affairs (Cutler) (1958), June 20, in Nuclear Policy, Box 14, NSC Series, Briefing Notes Subseries, White House Office, Office of the Special Assistant for National Security Affairs: Records, 1952-1961, DDEL.

[124] Memorandum From the Chief of Naval Operations (1958), Unclassified Summary of NAVWAG Study No. 5 (National Implications of Atomic Parity), January 22, in Nuclear Exchange (1), Box 21, Alpha Subseries, Subject Series, White House Office, Office of the Staff Secretary: Records, 1952-1961, DDEL.

[125] For more details on the CNO's alternative approach to nuclear strategy, see William Burr, (2009), ed., "How Much is Enough?: The U.S. Navy and 'Finite Deterrence'" (Washington, DC: The National Security Archive), EBB No. 275.

the Soviet Union coincidently reached an apex.[126] A memo to Cutler from a staffer in March 1958 commended him for "wrestling with the major problem of the Free World today – the mutuality of massive deterrent," but pointed out that other senior officials had yet to grasp the concept.[127] Karl Harr, Deputy Assistant Secretary of Defense for International Security Affairs, disagreed entirely with Cutler's notions of deterrence. From Harr's experience, Soviet leaders were "emboldened by weakness and deterred by strength," making the national security advisor's strategy a risky and possibly counterproductive option.[128] As Eisenhower officials continued to spar over the most appropriate wartime objectives for U.S. forces, the DOD would continue to push for the development of capabilities that would cause "damage on such a scale as to enable us to emerge successfully in the event of general war with the USSR."[129]

A meeting of the NSC in early 1959 highlights how the president – somewhat in contradiction with his own views several years earlier – and his top military advisors espoused a similar mindset. At several points during the conversation, Eisenhower argued forcefully against any plans besides "hitting the Russians as hard as we could," and concluded that "we ought to be clear among ourselves that if we are going to hit the Soviet Union, we are going in the process to

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[126] For a detailed look at the Eisenhower Administration's approach and response to the notion of the "missile gap," see Prados (1982), pp. 75-95, 111-113. See also May et al (1981), pp. 414-415.

[127] Memorandum From Captain Jack Morse to the President's Special Assistant for National Security Affairs (Cutler) (1958), "Massive Deterrent", March 8, in Nuclear Policy, Box 14, NSC Series, Briefing Notes Subseries, White House Office, Office of the Special Assistant for National Security Affairs: Records, 1952-1961, DDEL. Emphasis in the original.

[128] Memorandum From the Deputy Assistant Secretary of Defense for International Security Affairs (Harr) to the President's Special Assistant for National Security Affairs (Cutler) (1958), "Some Elements of a National Military Strategy in a Time of Maximum Tension, Distrust and Destructive Capability," April 7, in Limited War, Box 3, OCB Series, Subject Subseries, White House Office, Office of the Special Assistant for National Security Affairs: Records, 1952-1961, DDEL.

[129] Memorandum of Discussion at the 348th Meeting of the National Security Council (1958), October 30, *FRUS* 1958-1960, Vol. III, National Security Policy, Arms Control and Disarmament, Document 36.

remove the threat posed by the Soviet Union."[130] Speaking on behalf of the Joint Chiefs, Air Force Chief of Staff General Twining concurred, voicing his enthusiasm for "shooting the works," especially since

> we had war-gamed a general war against the Sino-Soviet Bloc three times and in each case the U.S. had managed to survive despite the fact that so many people nowadays argue that the U.S. and the U.S.S.R. each has the power to destroy the other in the event of general war between them.[131]

These comments suggest that surviving a nuclear war and defeating the Soviet Union continued to be seen by these figures as the only acceptable propositions, even if such outcomes necessitated tens of millions of American lives.

Strategic assessments performed in the late 1950s confirmed the notion that the United States could defeat the Soviet Union. Focusing on capabilities the early 1960s, a time when both superpowers were expected to deploy ICBMs, NESC reports reiterated what was by now a foregone conclusion.[132,133] Nuclear war would be catastrophic, with each side experiencing no

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[130] Memorandum of Discussion at the 394th Meeting of the National Security Council (1959), January 22, *FRUS* 1958-1960, Vol. III, National Security Policy, Arms Control and Disarmament, Document 47.

[131] Memorandum of Discussion at the 394th Meeting of the National Security Council (1959), January 22, *FRUS* 1958-1960, Vol. III, National Security Policy, Arms Control and Disarmament, Document 47.

[132] Discussion of the 1958 conclusions can be found in Burr (2014), ed., EBB No. 480, Documents 4A-4C. Details of Study No. 2009 come from Staff of the Net Evaluation Subcommittee of the National Security Council (1959)*, Appraisal of Relative Merits, From the Point of View of Effective Deterrence, of Alternative Retaliatory Efforts*, October 30, in Net Evaluation Subcommittee Appraisal of Relative Merits, From the Point of View of Effective Deterrence, of Alternative Retaliatory Efforts, Box 1, Intelligence Files, U.S. National Security Council Presidential Records, DDEL.

[133] The studies portrayed a strategic picture so similar that senior officials were beginning to find the exercise redundant. William Burr, (2004b), ed., "The Creation of SIOP-62: More Evidence on the Origins of Overkill" (Washington , DC: The National Security Archive), EBB No. 130, Note 9.

less than 50 million fatalities, the destruction of one-third of industry, and the paralysis of government. While the subcommittee concluded in 1958 and 1959 that it would take years to fully recover, the United States could prevail, calculations began to point in another direction as Eisenhower headed into his last year in office.[134] The last NESC study ended on a less optimistic note than essentially all of the subcommittee's preceding work.[135] While the initial trading of nuclear blows would advantage the United States, the NESC left open the question of the post-conflict balance of strength. In a break with contemporary intelligence and JCS estimates, the size of U.S. and Soviet residual nuclear forces led the subcommittee to conclude that the "initial exchange in these circumstances would not necessarily determine the outcome of the war."[136] For essentially the first time, the NESC questioned how a nuclear war would turn out.

But by the time these calculations – which shored up the position of Cutler, Dulles, and Burke – made their way to the policy leadership, it was too late to make an impact. By 1960 new intelligence information had produced a clearer and less urgent picture of Soviet ICBM capabilities, just as the United States was seeing some benefits from post-Sputnik efforts to

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[134] The conclusions about targeting schemes made in the 1958 study helped to lay the basis for the focus of the NESC's work during 1959, the result of which was "Study 2009." Study 2009 was highly influential in the development of the first nuclear war plan. See Burr (2014), ed., EBB No. 480, Document 4B.

[135] The subcommittee's last report under Eisenhower was finished in 1959 but circulated in 1960. See *1959 Report of the Net Capabilities Evaluation Subcommittee*, no date, in Net Evaluation Subcommittee Appraisal of Relative Merits, From the Point of View of Effective Deterrence, of Alternative Retaliatory Efforts, Box 1, Intelligence Files, U.S. National Security Council Presidential Records, DDEL; Memorandum of Discussion at the 442nd Meeting of the National Security Council (1960), April 28, *U.S. Declassified Documents Online*, pp. 1-8.

[136] A few months' earlier intelligence and JCS estimates had predicted that by 1962 both the United States and Soviet Union would have decisive military capability; consequently whichever side struck first would subsequently win the war. Memorandum by Director of Central Intelligence Dulles (1959), August 18, *FRUS* 1958-1960, Vol. III, National Security Policy, Arms Control and Disarmament, Document 71, p. 317. Referral to the JCS prediction in late 1959 can be found in Memorandum of Discussion at the 469th Meeting of the National Security Council (1960), December 8, *FRUS* 1958-1960, Vol. III, National Security Policy, Arms Control and Disarmament, Document 129, p. 496.

jumpstart its own missile economy. As a result anxiety within the executive branch about a "missile gap" began to subside.[137] Any concerns about the future balance were outweighed by confidence among the president and other senior officials about the size and makeup of the U.S. arsenal in 1963.[138] Furthermore, the president responded to concerns about the limited ability of the United States to defend against an ICBM attack by considering other options to limit damage to home territory.[139] In addition to continuing work on anti-ballistic missile technology, Eisenhower promptly requested an urgent review of measures he had dismissed three years earlier: passive defenses, particularly shelters.[140] Thus in spite of an increasingly pessimistic outlook on the feasibility of defending against a nuclear attack, the president redoubled U.S. efforts to make this form of damage limitation a reality. At the end of Eisenhower's term,

[137] For example, as pointed out by Defense Secretary Gates at a meeting in January 1960, "it now appeared that the intelligence estimate had undergone a considerable change and that it now virtually says there is no missile gap." "If this is the case," Gates continued, "the U.S. has a very strong deterrent force." Memorandum of Discussion at the 348th Meeting of the National Security Council (1960), January 7, *FRUS* 1958-1960, Vol. III, National Security Policy, Arms Control and Disarmament, Document 82. This being said, the "missile gap" remained a contentious domestic political issue, particularly during the 1960 presidential campaign.

[138] Memorandum of Discussion at the 348th Meeting of the National Security Council (1960), January 7, *FRUS* 1958-1960, Vol. III, National Security Policy, Arms Control and Disarmament, Document 82; Memorandum of Discussion at the 439th Meeting of the National Security Council (1960), April 1, *FRUS* 1958-1960, Vol. III, National Security Policy, Arms Control and Disarmament, Document 94.

[139] The DOD stressed this point in September 1960, reporting that for at least the next ten years "effective active defense of the continent and especially of our nuclear retaliatory force will not be available." As explained by the Secretary of Defense later that year, "even if we spend $500 million a year beginning this year, and assuming that all the complicated hardware functioned properly, we would be able to defend only 20 percent of the population against ICBM's by 1969." Memorandum of Discussion at the 471st Meeting of the National Security Council (1960), December 22, *FRUS* 1958-1960, Vol. III, National Security Policy, Arms Control and Disarmament, Document 133.

[140] Memorandum From the Assistant Secretary of State for Policy Planning (Smith) to Secretary of State Herter (1960), NSC 6022 "Continental Defense," December 21, *FRUS* 1958-1960, Vol. III, National Security Policy, Arms Control and Disarmament, Document 132.

mounting evidence about the enduring nature of the eventual balance did not stop him from trying to overcome the condition altogether.

The Eisenhower Administration and mutual vulnerability: concluding thoughts

At the end of the Eisenhower Administration, the U.S.-Soviet strategic environment was much more built up than it had been at the start. The U.S. arsenal had surged from roughly 1,000 weapons in 1953 to almost 19,000 in 1960, with over 1,000 long-range bombers (and even more medium-range aircraft) available to carry these weapons. The Soviet Union's nuclear capabilities had expanded at a slower rate, but by 1961 it had an arsenal of over 2,000 weapons and enough delivery capability to cause extraordinary damage in the United States. Equally critical to the quantitative dimension of the strategic arms competition were qualitative improvements; both sides also now had weapons with much higher explosive yields thanks to hydrogen bomb technology, and were on the verge of deploying ballistic missiles. Still, though the technical basis underlying mutual vulnerability had evolved extremely rapidly during the 1950s, an argument could still be made that it was not necessarily permanent. Neither side had operational ICBMs and a serious disparity between U.S. and Soviet striking power remained, which effectively gave the United States an option of reducing the risk of unacceptable damage in nuclear war, albeit under highly favorable (and decreasingly realistic) attack conditions.[141]

That being said, the costs of a future nuclear war still grew astoundingly over the 1950s; specifically, expected average population losses in the United States skyrocketed from about 10 million to 70 million. In the context of this increasing toll, some policy-makers denied that an inescapable, mutually vulnerable strategic situation was in the process of emerging. In particular,

[141] The United States and Soviet Union would both deploy their first ICBMs in or around 1961. See May et al (1981), pp. 431-438, 636.

top officials at the DOD and within the JCS maintained that the United States could defeat the Soviet Union in a future conflict and that with a strong enough boost, the United States could avoid or reverse a stalemate with the Soviet Union. As long as a winning advantage was possible, questions about the accompanying costs appeared to take lower priority. The imperative of defeating the Soviets overshadowed anxieties about the incomplete protection of U.S. society.

The stance taken by the DOD and JCS was also consistent with strategic assessments through 1959, which presented a grim but not hopeless outlook on the prospect of superpower nuclear war. Through the late 1950s the demands of nuclear war grew more complicated; on top of greater numbers of strategic offensive forces, calculations showed that the United States would potentially need passive and active defenses, along with an optimal targeting mix to come out ahead of the Soviet Union. But assessments continued to emphasize that the United States had the capacity and national will to prevail, or at least emerge with more population, industry, and government intact than the Soviet Union.

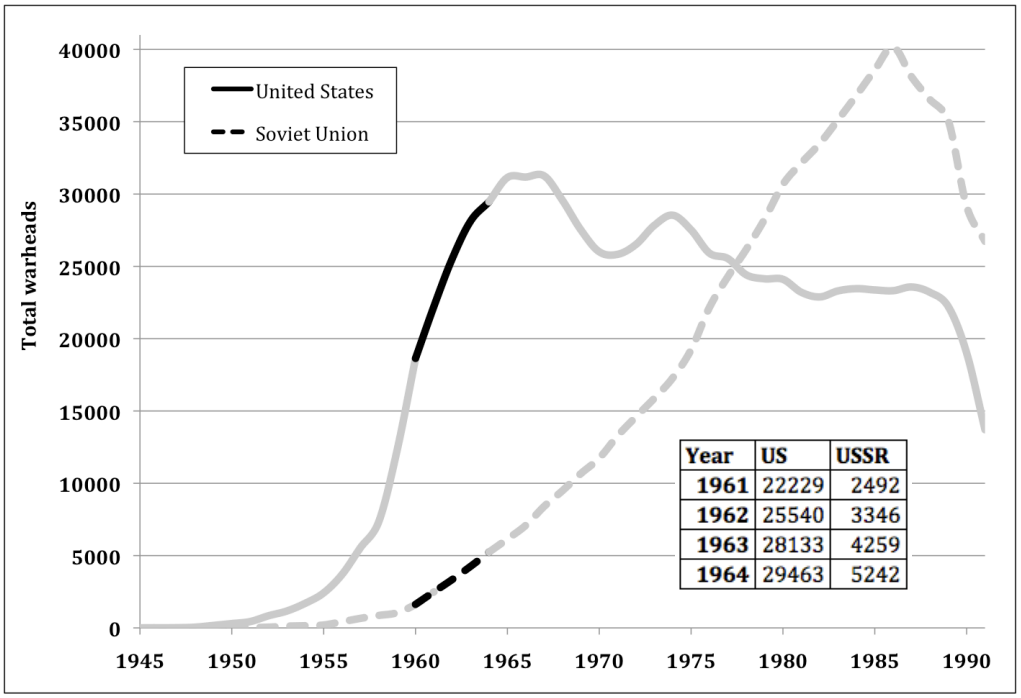
Though U.S. nuclear policy under Eisenhower tended to be driven by those who did not believe strategic situation would persist, an increasing number of high-level officials were more accepting. Starting in the mid-1950s Eisenhower officials began to pick up on the trends that some had noticed at the end of Truman's presidency. The mounting challenges of solidifying and maintaining superiority in a conflict setting resonated with some, most notably Secretary of State Dulles. Others, like Eisenhower's national security advisor and the office of the CNO saw the approaching strategic stalemate as indefinite and subsequently advocated more modest levels of secure, retaliatory forces to support U.S. deterrence. However, this approach never seemed to gain a critical mass of support.

As for President Eisenhower, he did not exactly provide a consistent voice. He abhorred the escalating costs of nuclear war and doubted whether more strategic capability could really better U.S. chances against the Soviet Union. Ultimately the president saw the damage caused by a nuclear war as something that had to be accepted if conflict with the Soviet Union came to pass; preparing to wage such a war was the best way to minimize U.S. casualties, albeit at high levels. As the president explored all possible methods of damage limitation, even approaches he initially rejected, he may have believed his decisions were appropriately hedging against an uncertain future, one that could change in step with advancing capabilities on both sides. Given the fast pace of technological change taking place during this decade, this calculus is not surprising. Concerns that the United States was falling behind were relentless, particularly in the wake of Sputnik and both the "bomber gap" and "missile gap." Indeed, these eight years witnessed a succession of "windows of vulnerability," though these concerns never bore out as valid.

In 1960 the long-term vulnerabilities of U.S. forces were clearer than they had been in 1953, and the dilemma this posed for U.S. policy-makers had become more intransigent. Though the expansion of U.S. missile economy following Sputnik gave off the impression that the U.S. position vis-à-vis that of the Soviet Union was improving, quantitative calculations suggested otherwise. For the first time the NESC concluded that in a few years, the initial stage of a nuclear war would not determine its victor. As such, a primary working measure of U.S. superiority – the ability to levy more damage than it would have to absorb – was called into question. At the same time, there were increasing signs that the weaknesses of strategic defenses were bound to persist; in particular, there was no feasible way to counter ballistic missiles on the horizon. As the

Eisenhower Administration drew to a close, the durability of mutual vulnerability was apparent, making efforts to escape it increasingly tenuous.

Chapter 4: Mutual vulnerability during the Kennedy Administration



Year	US	USSR
1961	22229	2492
1962	25540	3346
1963	28133	4259
1964	29463	5242

Figure 3. U.S. and Soviet warhead levels during the Kennedy Administration[142]

Under President John F. Kennedy, it can be argued that the technical basis for an inescapable relationship of mutual vulnerability between the two superpowers emerged. A numerical comparison of capabilities in the early 1960s continued to favor the United States, which boasted over 20,000 more nuclear weapons than the Soviet Union and a striking force of about 1,500 long-range bombers and several hundred first-generation intercontinental ballistic missiles (ICBMs).[143] However, during this (albeit short) period the material implications of the Soviet nuclear threat increased dramatically. The arsenal's sheer size and reach by 1964 –

[142] Kristensen and Norris (2013), pp. 81-82.
[143] The figures cited in this paragraph come from either Kristensen and Norris (2013), p. 81, or May et al (1981), p. 636.

comprising over 5,000 nuclear and thermonuclear weapons and close to 500 ICBMs and strategic bombers – prohibitively complicated U.S. chances of a successful disarming or near-disarming attack. Thus by the end of the Kennedy Administration, Soviet strategic strength effectively presented the United States with a reciprocal challenge.

Between 1961 and 1963 the extraordinary vulnerability of the U.S. homeland to Soviet nuclear attack was a standard piece of conversations about national security strategy, but only some Kennedy officials saw the condition as a permanent fact of life. For this group, the basic materiel picture was not encouraging. As listed below in Table 4, strategic assessments continued to demonstrate that that on average, a nuclear exchange taking place that decade would result in about 85 million fatalities in both the United States and the Soviet Union. One key entity that believed that this situation was unlikely to change was the NSC, whose leadership expressed concerns about the infeasibility of maintaining superiority. Foremost among this cohort was the Secretary of Defense, Robert McNamara, who remain unconvinced that the situation in the United States after a nuclear war could really be distinguished from that of the Soviet Union. McNamara found the military services' notion of "unacceptable damage" much too high, and through his yearly budget recommendations highlighted the marginal effectiveness of large increases in U.S. strategic power in order to contest the agenda of those who denied the inescapability of U.S.-Soviet mutual vulnerability.

Table 4. Major strategic assessments during the Kennedy Administration

Assessment	**U.S. fatalities (millions)**	**Soviet fatalities (millions)**
WSEG 50 (1961)	60-90	N/A
NESC (1961)	68-83	67
ISA-NSC (1961)	Negligible - 140	0.5-1
ISA (1961)	12-177	3-68
NESC (1962)	47-93	69-93
DPM (1962)	30-95	17-83
NESC (1963)	63-134	136-143

Though McNamara's views tended to overlap with the White House staff and the president himself, those who had accepted the enduring nature of the strategic circumstances repeatedly compromised their stance to satisfy the demands of the military services. From the perspective of the Chiefs, as well as one of McNamara's deputies, Paul Nitze, greater numbers of U.S. nuclear forces offered a mechanism to break free from the current strategic dilemma. Their position was buoyed by two analyses performed in the summer of 1961, noted in the third and fourth row of Table 4, which found that a U.S. nuclear attacks could be "moderately" successful and potentially keep U.S. casualty levels low. Optimism about the U.S. ability to absorb a nuclear war was also enhanced by the revelation in 1961 that there was no "missile gap" favoring the Soviet Union. This cohort continued to argue that under the right conditions, it was entirely possible that the United States could emerge from a nuclear war in a relatively better position than its adversary.

By the fall of 1963, the optimism of previous years about U.S. prospects in large-scale nuclear war was fading. Models of nuclear conflict in the mid-to-late 1960s provided strong evidence of the inescapability of mutual vulnerability, with the NESC finding for the first time that regardless of the parameters, neither superpower could emerge from a nuclear war without

incurring unacceptably high levels of damage. Views expressed in reaction to this conclusion and as part of the OSD defense presidential memorandum process that year confirm that several major Kennedy operatives thought the current stalemate between U.S. and Soviet forces would persist. In other words, there was some consensus among analysts and officials, notably Kennedy, McNamara, and McGeorge Bundy, the national security advisor, that the United States would not be able to escape from its mutually vulnerable relationship with the Soviet Union. However, despite the high levels at which these views were held, domestic political concessions were made on strategic force levels in order to maintain a credible relationship with Congress and the Joint Chiefs.

Early divide on the chances of prevailing in nuclear war

As new national security advisor McGeorge Bundy reviewed existing defense policy, the outgoing Eisenhower Administration's position on the U.S.-Soviet nuclear balance was clear.[144,145] U.S. strategic defenses were not in good shape. Air defenses and early warning radar

[144] Memorandum from A. Sidney Buford for the President's Special Assistant for National Security Affairs (Bundy) (1961), January 24, in Series 06, Box 318, Key national security problems, NSF, John F. Kennedy Presidential Library, Boston, Massachusetts (hereafter cited as JFKL); Memorandum from Robert H. Johnson for the President's Special Assistant for National Security Affairs (Bundy) (1961), January 30, in Series 06, Box 318, Key national security problems, NSF, JFKL.

[145] While these comments are indicative of general perceptions at the time, they refer specifically to the "Power Positions" study conducted by the Eisenhower NSC over the course of 1960. Officially titled "Principal Factors Affecting the Future Power Positions of the Free World and Sino-Soviet Bloc," this analysis was intended to assist in the formulation of long-term policy by estimating future military and non-military trends through 1965 and 1970. The full report has not been found in the open literature, but details about its contents are cited by memoranda at the time. In addition to the above correspondence, see Memorandum From A. Sidney Buford, III, to the President's Special Assistant for National Security Affairs (Gray) (1960), Principal Factors Affecting the Future Power Positions of the Free World and Sino-Soviet Bloc, March 4, in Special Assistants Series, Presidential Subseries, Box 4, 1960 – Meetings with President – Volume 1, NSF, DDEL; and Memorandum From Robert Johnson to the President's Special

would be of little help against a Soviet attack delivered by ICBMs, and effective ballistic missile defenses (BMD) would not come to fruition for at least another decade. In addition to destroying a significant fraction of U.S. forces, a large-scale Soviet offensive in the next few years would raise doubts about the recovery of the United States. At the same time, however, Eisenhower's team argued that the U.S. defense establishment had the technical wherewithal to turn the situation into a more acceptable one. By 1963 U.S. investments in passive defenses and greater numbers of hardened missiles would secure a "second strike and prevail" capability. In other words, U.S. superiority was waning, but with the right investments it could be regained within a couple of years.

The first two strategic assessments briefed to Bundy and other Kennedy officials ran contrary to this relatively sanguine outlook. The 1961 NESC report concluded that nuclear war in 1963 would be catastrophic.[146] The subcommittee had calculated the effects of three Soviet surprise offensives of increasing weight, each followed by a U.S. retaliatory attack. According to the NESC, a U.S.-Soviet nuclear exchange would result in U.S. fatalities totaling 68 million to 83 million (close to one-half of the projected population) and the loss of 43 percent to 58 percent of U.S. industrial capacity. Much of the U.S. governmental, economic and military structure would be "shattered." The Soviet Union suffered effects of similar magnitude: 67 million dead and 50 percent of industry inoperative for at least one year.[147] Like the NESC's assessment the

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Assistant for National Security Affairs (Gray) (1960), Major Problems Affecting National Security Policies During the 1960s, April 12, *U.S. Declassified Documents Online.*

[146] Discussion of this report is derived from National Security Council (1961), *1961 Report of Net Evaluation Subcommittee: Summary and Conclusions*, in Burr (2014), ed., EBB No. 480, Document 7A.

[147] It is unclear whether this assessment would have changed if the report had incorporated more accurate estimates of Soviet forces. Page ii of the NESC report cites NIE 11-8-60, *Soviet Capabilities for Long-Range Attack through Mid-1965,* dated 1 August 1960. According to Cold War historian Raymond Garthoff, this NIE was one of the greatest overestimates of Soviet forces

year before, it was not totally clear which state might prevail under these circumstances; in two of the cases, Soviet power was ultimately superior, while the other case favored the United States.

An evaluation by the WSEG of U.S.-Soviet nuclear war in the 1964-1967 timeframe suggested that as time went on, there would be little recourse to avoiding extraordinarily high levels of damage.[148,149] Their report, WSEG 50, found that even if the United States had the advantages of striking first, successfully prosecuting all known enemy forces, and deploying substantial civil defenses at home, Soviet retaliation would still kill around 60 million Americans. Estimated fatalities increased to 90 million in the absence of a shelter program.[150] Consequently the study was critical of premising U.S. nuclear plans on the notion of counterforce, warning that an attack on military targets did not represent a "high confidence

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that decade; see Raymond L. Garthoff (2001), "Estimating Soviet Military Intentions and Capabilities," in Gerald K. Haines and Robert E. Legget, eds., *Watching the Bear: Essays on the CIA's Analysis of the Soviet Union* (Central Intelligence Agency, Center for the Study of Intelligence). While a full account of the NESC briefing is not available, a modest amount of detail was recorded in "Notes on National Security Council Meeting, 20 July 1961," in Burr (2014), ed., EBB No. 480, Document 7B. These notes include a question from the President as to how the effectiveness of the nuclear offensives depicted by the NESC reports had evolved since the first assessment in 1957.

[148] The WSEG was an analytical sub-body of the JCS stood up in 1948 with the directive of providing objective research on weapons-related issues for the Chiefs and Secretary of Defense. As of August 2016, WSEG 50 was not available in full to the public. The best description of the report's analysis and findings is based on interviews with study participants. See Desmond Ball (1980), *Politics and Force Levels: The Strategic Missile Program of the Kennedy Administration* (Berkeley: University of California Press), pp. 34-38.

[149] WSEG 50 reached so many members of the incoming Kennedy Administration that it has been named the group's most influential report. According to a history of the group, in addition to McNamara this report was briefed to "the Deputy SecDef, the DDR&E, the JCS, and others in the Pentagon, as well as to the President's Science Advisor, the Bureau of the Budget, and other offices involved in the early McNamara/Kennedy defense reviews." See Ponturo (1979), pp. 175-178. See also Memorandum from the Executive Secretary of the Joint Chiefs of Staff (Chapla) to the President's Special Assistant for National Security Affairs (Bundy) (1961), March 3, in Series 16, Bromley K. Smith Files, Box 473, Nuclear Weapons Deployment, NSF, JFKL; Ball (1980), pp. 37-38.

[150] Fred Kaplan (1983), *The Wizards of Armageddon* (New York: Simon and Schuster), p. 259.

measure for preventing unacceptable levels of damage to the U.S. in the event of war."[151] First-strike uncertainty would linger on both sides. "Without a major technological breakthrough," the WSEG predicted, neither superpower could expect to negate the other's ability "to maintain a retaliatory force capable of inflicting great damage."[152]

As these calculations percolated through the upper echelons of the administration, the offices of Bundy and Paul Nitze, assistant secretary of defense for international security affairs (ISA), began to craft a top-level BNSP statement similar to what had been developed and maintained under Eisenhower.[153] A lack of consensus on what could be done about the worsening strategic circumstances hinted at an early split among senior Kennedy policy actors regarding the inescapability of mutual vulnerability. Specifically, there were two general views on whether strategic capabilities could be acquired or developed that would put the United States in a relatively better position following a nuclear war. From the ISA and JCS perspective, the answer was clear: this was absolutely a possibility. The initial BNSP draft, primarily an ISA product, specified that U.S. retaliatory forces should be able to "reduce enemy residual military capability at least to levels that will avoid the strategic inferiority of U.S. residual forces, and if

[151] A summary of WSEG 50's key conclusions can be found in *FRUS* 1961-1963, Vol. VIII, National Security Policy, Document 8, p. 14.
[152] *FRUS* 1961-1963, Vol. VIII, National Security Policy, Document 8, p. 14.
[153] Unlike the Eisenhower experience, the BNSP never became official policy, though the exercise still offered the top leadership a useful forum for exploring the most desirable "bone structure of policy." Memorandum From the Chairman of the Policy Planning Council and Counselor of the Department of State (Rostow) to Secretary of State Rusk (1963), BNSP, July 23, *FRUS* 1961-1963, Vol. VIII, National Security Policy, Document 136, p. 490. Memorandum From the Chairman of the Policy Planning Council and Counselor of the Department of State (Rostow) to the President's Special Assistant for National Security Affairs (Bundy) (1963), July 24, in Series 06, Staff Memoranda, Box 323, Walt Rostow, NSF, JFKL.

consistent with other U.S. wartime objectives, give the U.S. strategic superiority."[154] The JCS wanted stronger language, pushing for U.S. forces to be aimed at securing a "clear military advantage" under all circumstances; they also thought the current war plan, Single Integrated Operational Plan 62 (SIOP-62), was sufficient for accomplishing this objective.[155] The Chiefs repeated their stance during the next BNSP review, urging that the United States required the capability to "defeat" enemy forces.[156] While their position did not gain much official traction, just as they had under Eisenhower the JCS continued to press this case in both BNSP- and budget-related discussions.[157]

Less convinced that the post-exchange reality in the United States would really differ from that of the Soviet Union was Kennedy's defense secretary (and Nitze's boss), Robert McNamara. McNamara and Nitze repeatedly sparred over the extent to which damage from a nuclear war could be limited. During a meeting on rising tensions over Berlin, Nitze argued the

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[154] Letter From the President's Deputy Special Assistant National Security Affairs (Kaysen) to the Deputy Assistant Secretary of Defense for International Security Affairs (Rowen) (1961) June 16, *FRUS* 1961-1963, Vol. VIII, National Security Policy, Document 30, p. 103.
[155] *FRUS* 1961-1963, Vol. VIII, National Security Policy, Document 39, p. 121. Later on that year, the Chiefs would tell the President that executing the current SIOP "should permit the United States to prevail in the event of general nuclear war." See Scott D. Sagan (1987), "SIOP-62: The Nuclear War Plan Briefing to President Kennedy," *International Security*, Volume 12, Number 1, Summer, p. 51.
[156] Memorandum From the Acting Assistant Secretary of Defense for International Security Affairs (Rowen) to Secretary of Defense McNamara (1962), Draft Basic National Security Policy, April 14, *FRUS* 1961-1963, Vol. VIII, National Security Policy, Document 78, p. 103.
[157] Agenda, Tuesday Luncheon Group (1962), April 17, in Series 05, Box 294, Basic national security policy, NSF, JFKL. See also *FRUS* 1961-1963, Vol. VIII, National Security Policy, Document 109; Memorandum From the Joint Chiefs of Staff to Secretary of Defense McNamara (1962), December 7, *FRUS* 1961-1963, Vol. VIII, National Security Policy, Document 119; Memorandum From the JCS Chairman's Special Assistant (Goodpaster) to the Assistant Secretary of Defense for International Security Affairs (Nitze) (1963), Major Military Issues in Basic National Security Policy, April 20, *FRUS* 1961-1963, Vol. VIII, National Security Policy, Document 132, p. 482.

United States could "in some real sense be victorious" if the crisis came to nuclear blows.[158] The secretary of defense disagreed, remarking that "neither side could be sure of winning by striking first and that the consequences to both sides of a strategic exchange would be so devastating that both sides had a very high interest in avoiding such a result."[159] Months later the gap between their views persisted. Nitze took issue with McNamara's BNSP revisions regarding the nuclear war outcome that would best deter the Soviet Union. Unless U.S. forces could convince Soviet leaders that a conflict would guarantee an inferior position, U.S. policy would be "too weak."[160] McNamara was not convinced, telling Nitze "the concept of a 'worsened relative position after a general nuclear war is not a meaningful one to me when each side has the capacity to destroy the other's civilization."[161] For the defense secretary, "winning" – regardless of how it was defined – was not worth the effort or costs.

The NSC ended up adopting a position that aligned more closely with McNamara. In a memo to Bundy's deputy Carl Kaysen, NSC staffer Marcus Raskin criticized an early BNSP draft for focusing too intently on prevailing when a "stalemate" was the most likely outcome.[162] Kaysen shared similar concerns about superiority in the long run with Bundy, noting the infeasibility of maintaining a strategic edge:

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[158] Minutes of meeting (1961), October 10, Berlin build-up and contingency planning, *FRUS* 1961-1963, Vol. XIV, Berlin Crisis, Document 173, p. 489.
[159] Minutes of meeting (1961), October 10, Berlin build-up and contingency planning, *FRUS* 1961-1963, Vol. XIV, Berlin Crisis, Document 173, p. 489.
[160] Memorandum From the Assistant Secretary of Defense for International Security Affairs (Nitze) to Secretary of Defense McNamara (1962), June 5, *FRUS* 1961-1963, Vol. VIII, National Security Policy, Document 89, p. 303.
[161] Memorandum From the Assistant Secretary of Defense for International Security Affairs (Nitze) to Secretary of Defense McNamara (1962), June 5, *FRUS* 1961-1963, Vol. VIII, National Security Policy, Document 89, p. 303.
[162] Memorandum from Marcus Raskin to Carl Kaysen (1961), June 14, Comments on Memorandum "Military and Related Aspects of Basic National Security Policy," Series 08, Carl Kaysen Files, Box 374, Military Policy, SAC, NSF, JFKL.

> It may be possible for unknown short periods to have an effective counterforce capability, but inevitably enemy reaction catches up with it, and the position settles back to its long-term state of mutual deterrence…it is never clear enough at any moment which side does have the advantage, for either side initially to make use of it. Thus, the program is wasteful; it may also be dangerous.[163]

Kaysen's clearly viewed any upper hand in the U.S.-Soviet strategic relationship as fleeting, a passing advantage that either adversary could quickly negate.

Officially the BNSP never came down firmly on one side or the other. Bundy's office was successful in altering the policy's language on viable nuclear war outcomes, but only slightly. Subsequent drafts opened up "the single goal of 'prevailing' in central war" to include "a spectrum of possible goals running from superiority to stalemate, the appropriate one of which is to be sought in the light of the situation at the time."[164] Future BNSP iterations did not yield to ISA or JCS recommendations, but the underlying disagreement was never resolved. The divergence of views between the NSC, the JCS, and within the department of defense continued to delay the BNSP draft and eventually caused the document to "drift off" into the bureaucratic abyss.[165]

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[163] Memorandum From Carl Kaysen to the President's Special Assistant for National Security Affairs (Bundy) (1961), June 8, in Series 05, Box 294, Basic national security policy, NSF, JFKL, p. 4.

[164] Letter from the President's Deputy Special Assistant for National Security (Kaysen) to the Deputy Assistant Secretary of Defense for International Security Affairs (Rowen) (1961), Draft of Proposed "Military and Related Aspects of Basic National Security Policy", June 16, *FRUS* 1961-1963, Vol. VIII, National Security Policy, Document 30, p. 103.

[165]Memorandum From the Chairman of the Policy Planning Council and Counselor of the Department of State (Rostow) to Secretary of State Rusk (1963), BNSP, July 23, *FRUS* 1961-1963, Vol. VIII, National Security Policy, Document 136, p. 490. Memorandum From the Chairman of the Policy Planning Council and Counselor of the Department of State (Rostow) to the President's Special Assistant for National Security Affairs (Bundy) (1963), July 24, in Series 06, Staff Memoranda, Box 323, Walt Rostow, NSF, JFKL.

Fragile optimism as the strategic balance appears to improve

The U.S. ability to manipulate the balance became more tangible as the technical balance seemed to tilt in its favor. Early on within Kennedy's cohort was a conviction that a war fought with nuclear weapons might not necessarily take the form of the instantaneous and all-out exchange envisioned by Eisenhower.[166] Once in office, they set about trying to define scenarios that might reduce the costs to the United States to a more acceptable level. This effort was accelerated by the second Berlin Crisis, which forced the administration to articulate how the United States could use fewer nuclear weapons than the numbers stipulated by the current nuclear war plan.[167] Calculations during the summer of 1961 directed by Henry Rowen, Nitze's deputy at ISA, RAND consultant William Kaufman, and Kaysen were cautiously optimistic about a U.S. strike on Soviet capabilities as part of an escalating Berlin contingency.[168] Their study predicted that with minimum warning, an attack by a much smaller force than committed to SIOP-62 would have a "fair probability of achieving substantial measure of success" in eliminating the Soviet nuclear threat to the United States.[169] That being said, there was tremendous variation in the level

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[166] This assessment came from a defense policy report by Senator Kennedy's National Security Policy Committee, which had been led by Paul Nitze. It was forwarded to McGeorge Bundy by Theodore Sorenson on January 17, 1961. See U.S. Department of State, *FRUS* 1961-1963, Vol. VIII, National Security Policy (Washington, D.C.: U.S. Government Printing Office, 1996), Document 1, pp 1-2.

[167] A memo to Bundy from Henry Kissinger, then a consultant to the NSC, on the topic of Berlin planning attested to the lack of options besides the SIOP: "…before (the President) makes the decision (to risk nuclear war over Berlin) he has to know what is meant by nuclear war. It would therefore seem to me essential that the nature of our nuclear options be defined now." See Fred Kaplan (2001), "JFK's First-Strike Plan," *The Atlantic Monthly*, October, p. 82.

[168] The development of this first-strike plan is the subject of Kaplan (2001).

[169] Memorandum From the President's Deputy Special Assistant for National Security Affairs (Rostow) to the President's Military Representative (Taylor) and Carl Kaysen (1961), September 7, NSF, JFKL, p. 3; Memorandum for the President's Military Representative (Taylor) (1961), September 7, Strategic Air Planning and Berlin, Digital National Security Archive, Collection on Nuclear History, p. 2. General Taylor restated this plan to the president a few days later; see Memorandum From the President's Military Representative (Taylor) to President Kennedy

of suffering the Soviet Union could inflict in response. Though U.S. casualties might be "negligible," they could also potentially get as high as 75 percent of the population, or roughly 140 million.[170]

Around the same time, another ISA assessment reiterated the possibility of a less pessimistic post-conflict picture (relative to Eisenhower-era calculations) as well as the large range of uncertainty associated with such an outcome.[171] Subjecting the most recent NESC exchanges of Soviet offensives and U.S. retaliation in 1963 to various target systems and civil defense postures, ISA's results were more sensitive to analysis parameters than any other study under Kennedy. U.S. mortalities ranged from 12 million in the best case (Soviet attacks against U.S. military targets only, with improved civil defenses) to 177 million under the least favorable conditions (Soviet attacks against U.S. military targets and urban areas, without civil defenses).[172] Damage to the U.S. industrial base could have been as low as 2 percent or as high as 65 percent. In light of these figures, ISA advocated second-strike counterforce targeting, as this would make "a significant difference both to the military outcome of the war and to the amount of damage which the Soviets can visit on the U.S." In this case a nuclear war in which the United States retaliated against the Soviet military would be "terrible enough" but

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(1961), Strategic Air Planning and Berlin, September 19, *FRUS* 1961-1963, Vol. VIII, National Security Policy, Document 43, p. 128.

[170] Kaplan (2001), p. 85.

[171] Discussion of the ISA analysis is derived from Office of the Assistant Secretary of Defense for International Security Affairs (1961), August 14, Series 08, Carl Kaysen Files, Box 374, Military Policy, SAC, NSF, JFKL. The routing slip attached to this document indicates the results were shared with a number of notable Kennedy security officials and consultants, including Bundy, Rostow, Kaysen, and Henry Kissinger. For more information on ISA and Berlin, see Joel C. Christenson (2014), *Office of the Assistant Secretary of Defense for International Security Affairs: A Brief History* (Washington, DC: Office of the Secretary of Defense, Historical Office); see William Burr (2010), ed., *Why is 'Poodle Blanket Classified?'* (Washington, DC: The National Security Archive), EBB No. 310.

[172] The level of redaction in the declassified version of this report precludes a fuller discussion of the differences between these two attacks.

"significantly" better than the fatalities incurred if the United States were to target urban-industrial areas.

Facilitating the idea that perhaps the United States could endure a nuclear war was an increased confidence about the position of U.S. capabilities relative to their Soviet counterparts thanks to the revelation by U.S. satellite intelligence that there was no "missile gap." By mid-1961 it had been made clear to the administration that the reverse was true; the United States had a commanding quantitative lead in the missile competition.[173] The exposure of the "missile gap" as myth improved attitudes toward the U.S.-Soviet balance and gave U.S. policy actors "secret comfort," at least for a time.[174] A 1962 joint review of the strategic situation by officials at the White House, state and defense departments, JCS, and CIA concluded that over the next five years, a nuclear war would leave the Soviet Union "in a militarily inferior position relative to the US under almost all circumstances of war outbreak."[175] Technical reads of the strategic situation were also more favorable around this time, with the 1962 NESC report predicting that both U.S.- and Soviet-initiated nuclear wars in 1965 would favor the United States.[176]

That being said, the evaporation of the "missile gap" only seemed to delay the inevitable. The working BNSP draft in 1962 belied persistent worries (reminiscent of those before the

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[173] In late 1961, a speech by U.S. Deputy Secretary of Defense Roswell Gilpatric publically evaporated notions of a missile gap, replacing the global image of U.S.-Soviet equality in strategic power with one of U.S. dominance.
[174] May et al (1981), p. 511.
[175] Memorandum for President Kennedy, Report on Implications for U.S. Foreign and Defense Policy of Recent Intelligence Estimates, *FRUS* 1961-1963, Vol. VIII, National Security Policy, Document 103, p. 365.
[176] National Security Council (1962), *1962 Report of Net Evaluation Subcommittee: Summary and Conclusions*, in Burr (2014), ed., EBB No. 480, Document 9B. U.S. fatality estimates were commensurate with previous reports (varying from 47 to 93 million), but the outcome for the Soviet Union was more pessimistic. Compared to the NESC's 1961 analysis, possible Soviet fatalities had increased by upwards of 26 million. In both scenarios, the United States appeared to end up with more surviving forces, resources, and industry.

notion of "missile gap" was dismantled) about the longevity of any present advantage. The United States might possess more powerful nuclear forces for a few years, but in the long run they were a "wasting asset."[177] Soon a number of nascent Soviet defense programs – hardened ICBMs, SLBMs, and BMD – would mature enough to alter the strategic landscape from one in which

> the U.S. holds the balance of nuclear superiority largely through manned bombers with neither side having an acceptable missile defense, to one where the U.S. offensive strength against military targets is neutralized by an invulnerable Russian missile force on land and sea and the Soviet homeland defenses are significantly better than those of the U.S.[178]

As General Maxwell Taylor, Kennedy's military representative and soon-to-be Chairman of the Joint Chiefs, explained to the president, these developments would quickly permit Soviet leaders to "tilt the scale in their favor and upset the present 'balance of terror.'"[179] The reportedly

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[177] Agenda, Tuesday Luncheon Group (1962), April 17, in Series 05, Box 294, Basic national security policy, NSF, JFKL.

[178] Memorandum From the President's Military Representative (Taylor) to President Kennedy (1962), Comments on "Report on Implications for U.S. Foreign and Defense Policy of Recent Soviet Intelligence," August 23, *FRUS* 1961-1963, Vol. VIII, National Security Policy, Document 104, p. 380. General Taylor was especially worried about the impact of Soviet BMD (at the time, referred to as anti-ballistic missile (ABM) technology) on the balance of forces. In the memo to President Kennedy he goes on to express acute concern about defenses, "particularly if (the Soviets) beat the U.S. to an effective ABM while the U.S. remains unprotected against missile attacks." In a letter to the Secretary of Defense two months later, he remarks how impressed he would be "…with the radical imbalance of opposing forces which would result if either sides deploys a reasonably effective ABM before the other." Memorandum From the Chairman of the Joint Chiefs of Staff (Taylor) to Secretary of Defense (McNamara)(1962), Initial and Supplemental Reports of the Special Studies Group on an Assessment of Programmed US Strategic Nuclear Forces, November 5, Digital National Security Archive, Collection on Nuclear History.

[179] Memorandum From the President's Military Representative (Taylor) to President Kennedy (1962), Comments on "Report on Implications for U.S. Foreign and Defense Policy of Recent

imminent decline of the U.S. position implies that for U.S. policy actors in late 1962, the balance of forces did not appear robust. A "steady state" of vulnerability was not part of common perceptions since the relationship between the forces on either side could be overturned, and in a relatively quick timeframe.

Against pressure from services McNamara seeks to align U.S. policy with mutual vulnerability

The most significant actor during the Kennedy years (and the Johnson presidency, for that matter) to accept that mutual vulnerability would persist indefinitely was Secretary of Defense McNamara.[180] He would repeatedly contest the notion, led by the military services, that greater amounts of defense spending could produce a situation in which nuclear war would be tolerable. Throughout the administration, the concept central to the secretary of defense's efforts was the logic of diminishing returns. For example, McNamara's decision at the very start of his tenure to audit existing JCS practices for sizing U.S. nuclear forces was influenced significantly by the WSEG 50 report's invocation of this idea. Looking at the U.S.-Soviet nuclear balance over the mid-1960s the WSEG had discovered a point in the growth of U.S. missile forces beyond which additional capacity would not improve the effectiveness of a U.S. second strike. Specifically, capabilities in excess of 1,000 Minutemen – about one-half of the size of the Strategic Air Command (SAC) request that year – would permit the same level of retaliatory destruction

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Soviet Intelligence," August 23, *FRUS* 1961-1963, Vol. VIII, National Security Policy, Document 104, p. 379.

[180] For more on McNamara's tenure as Secretary of Defense, see William W. Kaufman (1964), *The McNamara Strategy* (New York: Harper & Row); Lawrence S. Kaplan, Ronald D. Landa, and Edward J. Drea (2006), *History of the Office of the Secretary of Defense: Volume V, The McNamara Ascendancy 1961*-1965 (Washington, DC: Office of the Secretary of Defense, Historical Office).

against major Soviet cities.[181] Shortly thereafter McNamara also received briefings on SIOP-62 and RAND Corporation research on a "no cities counterforce" strategy.[182] Combined with the findings of WSEG-50, the costs of nuclear war estimated by these exercises provided the critical impetus for McNamara's subsequent request for JCS review of the requirements for strategic weapons.[183]

Over the next several years, McNamara contested the agenda of those who denied the inescapability of U.S.-Soviet mutual vulnerability through the defense presidential memorandum (DPM).[184] Originally conceived as a "method" but more often thought of as a policy product, DPMs on a variety of topics were prepared annually by OSD systems analysts, circulated to national security and military officials, and finally forwarded by McNamara to the president. As a major input to the process determining the following year's budget, the DPM represented the

[181] Kaplan (1983), p. 261; Ball (1980), p. 36.
[182] The SIOP-62 briefing to McNamara likely included expected fatalities should the war plan have run to completion, but the actual briefing that February is not yet available. That being said, JCS and DOD estimates of SIOP-62's effects at the time placed Soviet bloc fatalities around 400 million and minimum U.S. casualties at roughly 16 million. See Desmond Ball and Jeffrey Richelson, eds. (1986), *Strategic Nuclear Targeting* (Ithaca: Cornell University Press), p. 62, and Memorandum From the President's Military Representative (Taylor) to President Kennedy (1961), Strategic Air Planning and Berlin, September 19, *FRUS* 1961-1963, Vol. VIII, National Security Policy, Document 43, p. 128.
[183] This review laid the groundwork for OSD efforts over the next few years to make more limited, flexible, and controlled nuclear options available to national leaders in the event of conflict with the Soviet Union. Memoradum from the Secretary of Defense (McNamara) to the Chairman of the Joint Chiefs of Staff (Lemnitzer) (1961), February 10, Task Force Reports, Digital National Security Archive, Collection on Nuclear History; Memoradum from the Secretary of Defense (McNamara) to the Secretaries of the Military Departments, Defense Research and Engineering Chairman, Joint Chiefs of Staff, Assistant Secretaries of Defense, General Counsel, Special Assistants and Assistants to the Secretary of Defense (1961), March 8, Assignment of Projects within the Department of Defense, Digital National Security Archive, Collection on Nuclear History.
[184] Kaplan et al (2006), p. 84.

defense secretary's most significant opportunity to influence the future trajectory of U.S. strategic forces.[185]

The first DPM on strategic forces was drafted in September of 1961 (for fiscal year (F/Y) 1963), at a time when a U.S. first strike – underscored by the two ISA evaluations – was actively being considered as a potential response to Soviet action in Berlin. With the missile gap turned on its head, the key issue framing the memorandum was how much of an advantage over Soviet strategic forces the United States should strive for through 1967. The arguments laid out by the DPM emphasized that in spite of the improving technical picture, the United States would not be well served by the larger forces advocated by the military.[186] The memo compared the OSD recommendation with the higher numbers proposed by the services in terms of their relative ability to destroy Soviet targets in retaliation. With the difference almost imperceptible, OSD concluded that the "extra capability provided by individual Service proposals runs up against strongly diminishing returns and yields very little in terms of extra target destruction." McNamara reiterated this point in his testimony to the Senate Armed Services Committee on the defense budget. "We also tested a strategic retaliatory force roughly one-third larger than the one we are proposing here today," he explained, but "the additional capabilities that this larger force would provide are quite marginal in relation to the additional cost."[187]

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[185] May et al (1981), p. 514; *War and Peace in the Nuclear Age: At the Brink* (1986), Interview with Carl Kaysen [2], (Boston, MA: WGBH Media Library & Archives), retrieved from http://openvault.wgbh.org/catalog/V_926B527E1B30430D94B824360F9C6168.

[186] Discussion of the F/Y 1963 budget request is derived from Draft Memorandum From Secretary of Defense McNamara to President Kennedy (1961), Recommended Long Range Nuclear Delivery Forces 1963-1967, September 23, *FRUS* 1961-1963, Vol. VIII, National Security Policy, Document 46.

[187] Memorandum From George S. Brown to the President's Special Assistant National Security Affairs (Bundy) (1962), January 18, Series 04, Box 274, NSF, JFKL, p. 25.

Events over the following months suggest that in late 1961, more important than the appeal of McNamara's logic was political compromise with groups like the Chiefs and Congress, for whom greater numbers of U.S. nuclear forces offered a mechanism to break free from the current strategic situation.[188] In the wake of the DPM, several groups within the White House – including staffers of the national security advisor, the President's Office of Science and Technology, the President's Science Advisory Committee, and the Bureau of the Budget – sought lower missile numbers. Replicating the DPM analysis, this cohort proved that "strategic effectiveness" reached a plateau around 450 missiles, less than one-half of the 950 missiles that OSD had proposed. A meeting with President Kennedy and McNamara that December revealed that the White House staff's argument resonated with the Secretary of Defense, his original recommendation was the lowest number for which he would "not get murdered" by Congress (and most likely the SAC, which had requested three thousand missiles). Consequently, while key policy-makers within the Kennedy Administration appear to have accepted the logic of diminishing returns (and thus were at least implicitly accepting of an enduring mutually vulnerable relationship), domestic political imperative moderated its impact. In the absence of political and bureaucratic obstacles between mutual vulnerability and force posture decisions, the number of missiles recommended by the DPM would probably have been smaller.

When OSD drafted its DPM in 1962, the issue of tolerable nuclear war outcomes continued to provoke disagreement. As McNamara explained in his memo, the fundamental question for the president was

> …whether our forces should be augmented beyond (the OSD recommendation) in an attempt to achieve a capability to start a thermonuclear war in which the resulting damage

[188] The description of events here is derived from Ball (1980), pp. 85-87, 246.

to ourselves and our Allies could be considered acceptable on some reasonable definition of the term.[189]

At the time, the Chairman of the Joint Chiefs of Staff suggested that a "reasonable definition" might be tantamount to fatalities totaling around 10 percent of the population, as this would "probably be enough to destroy the will and capability to resist in either the US or USSR."[190] Thresholds for other parties varied. According to McNamara, the strategic forces advocated by the Air Force would, under optimal conditions, limit population losses to about 50 million (about 27 percent of the population at the time). "I do not consider this an 'acceptable' level of damage," the Secretary of Defense told the President.[191]

The decreased utility of seeking bigger and better nuclear forces was also prevalent in the fall 1962 DPM, especially now that advocates for higher missile levels were also employing the concept of diminishing returns, alleging that the "absolute value of feasible marginal improvements might nevertheless be high and well worth the costs involved."[192] Nonetheless, OSD repeated its line of reasoning. "Once we have a protected capability to destroy essentially all of (Soviet) urban society," the F/Y 1964 DPM read, "…there are limits to the extent to which

[189] Draft Memorandum From Secretary of Defense McNamara to President Kennedy (1962), Recommended FY 1964-FY 1968 Strategic Retaliatory Forces, November 21, *FRUS* 1961-1963, Vol. VIII, National Security Policy, Document 112.
[190] Memorandum From the Assistant Secretary of Defense for International Security Affairs (Nitze) to Secretary of Defense McNamara (1962), Initial and Supplemental Reports of the Special Studies Group on an Assessment of the Adequacy of Programmed US Strategic Nuclear Forces, November 5, Digital National Security Archive, Collection on Nuclear History. Interestingly, Taylor remarks that levels of damage beyond this level would be "meaningless."
[191] Draft Memorandum From Secretary of Defense McNamara to President Kennedy (1962), Recommended FY 1964-FY 1968 Strategic Retaliatory Forces, November 21, *FRUS* 1961-1963, Vol. VIII, National Security Policy, Document 112.
[192] May et al (1981), p. 514

extra strategic retaliatory forces help in these circumstances."[193] The persistence of marginal effectiveness arguments in the second strategic DPM alludes to the disagreements OSD continued to have over the size of "sufficient" nuclear forces, and demonstrates McNamara's convictions about the strategic balance's longevity.

Technical evidence of enduring mutual vulnerability is clear but divergent perceptions remain

By the fall of 1963, the optimism of the previous year about U.S. prospects in large-scale nuclear war was fading. The merits of seeking a nuclear balance favorable to the United States were more muddled, with superiority defined as the ability to "fight a war with a level of damage to the civilian population as well as to the military establishment which, although high, is nevertheless lower than that suffered by a potential enemy."[194] Models of conflict in the mid-to-late 1960s were much bleaker than before, with the 1963 NESC report stressing the inability of both the United States and the Soviet Union to alter the strategic situation.[195] Between 1964 and 1968, nuclear war was expected to cause ever-increasing U.S. casualty levels (63 million to 134

[193] Discussion of the F/Y 1964 budget request is derived from Draft Memorandum From Secretary of Defense McNamara to President Kennedy (1962), Recommended FY 1964-FY 1968 Strategic Retaliatory Forces, November 21, *FRUS* 1961-1963, Vol. VIII, National Security Policy, Document 112; and Memorandum From the President's Deputy Special Assistant for National Security (Kaysen) to the President's Special Assistant National Security Affairs (Bundy) (1963), October 25, Comment on DOD Draft Memorandum: Strategic Striking Forces (August 31, 1963), Digital National Security Archive, Collection on Nuclear History.

[194] Policy Planning Council, Department of State (1963), Basic National Security Policy Planning Tasks: Assignment, Status and Terms of Reference, February 21, Series 05, Box 294, Basic national security policy, NSF, JFKL.

[195] Discussion of the NESC's conclusions is derived from excerpts of the report itself, as well as notes on the oral briefing of the report conducted by the NESC director, General Johnson. See Memorandum From Leon W. Johnson to the Chairman, Net Evaluation Subcommittee (1963), 1963 Report of the Net Evaluation Subcommittee, National Security Council: Oral Presentation, August 27, *U.S. Declassified Documents Online*; "Summary and Conclusions, 1963 Report of the Net Evaluation Subcommittee, National Security Council," in Burr (2014), ed., EBB No. 480, Document 10A.

million over the course of the years under review), while Soviet fatalities consistently hovered at an astounding 140 million. The level of industrial damage caused by the attacks was also extensive, with about 35 percent to 50 percent of U.S. capacity destroyed, and 60 percent to 72 percent in the Soviet Union. Most importantly, for the first time the subcommittee concluded that regardless of the parameters, neither superpower could emerge from a nuclear war without incurring unacceptably high levels of damage. From a technical perspective, the inescapability of mutual vulnerability was hard to argue against.

The reaction to the 1963 NESC report represents one of the most articulate expressions of awareness of mutual vulnerability's permanence among top U.S. policy-makers over the course of the Cold War.[196] Bundy was first to acknowledge the assessment's severity, telling President Kennedy, the "fundamental conclusion is that these wars are unacceptably destructive for both sides on all assumptions."[197] The subsequent briefing to the NSC was rife with references to the enduring nature of the balance. Both the NESC director, Air Force General Leon Johnson, and Secretary McNamara agreed that the report implied that the United States and Soviet Union were locked in a stalemate. "There is no way to avoid unacceptable damage," Johnson admitted, "no matter what we do." The NESC director would also go on to say that contrary to a recent statement by the Air Force Association, attaining superiority would be impossible. From McNamara's perspective, the report vindicated his prior beliefs but also supported the findings of an internal DPM-related analysis of nuclear war that argued an additional $80 billion on defense would not prevent the United States from losing at least 30 million Americans. For the president

[196] Summary Record of the 517th Meeting of the National Security Council (1963), September 12, in Series 05, Meetings of NSC, Standing Group, and Executive Committee, Boxes 314-316, NSC Meetings - 1963, NSF, JFKL.
[197] Memorandum From President's Special Assistant for National Security Affairs (Bundy) to President Kennedy (1963), Net Evaluation Subcommittee Report 1963, September 12, Digital National Security Archive, Collection on Nuclear History.

and secretary of defense, the key takeaway was that preemption "now or in 1968 is not an acceptable course of action."

Around the same time the draft of McNamara's third DPM for President Kennedy similarly signaled the perpetual shadow of mutual vulnerability. As the defense secretary had mentioned during the NESC brief, an internal OSD study had found that even if the United States invested heavily in more offensive and defensive power (e.g., 750 extra Minutemen and an additional $80 billion in active and passive defenses), the Soviet Union could still cause 30 million casualties with a retaliatory strike.[198] As a consequence of the growth and dispersal of Soviet forces, the memo acknowledged that by the end of the decade, the United States would be unable to limit severe levels of damage to its population in the event of a nuclear war. Implicit in the DPMs central force-sizing criterion of "assured destruction" (AD) was acknowledgment that by 1969 Soviet nuclear forces (especially Soviet missiles) would have "priced" any chance of a viable counterforce capability "out of the range of feasibility."[199] The invocation of AD thus alludes to OSD perceptions that over time, substantial investments in counterforce would provide little utility in reducing the vulnerability of the United States. Ultimately OSD decided that a total missile force of 1200 Minutemen would suffice and recommended that the United States

[198] Draft Memorandum From Secretary of Defense McNamara to President Johnson (1963), Recommended FY 1965-FY 1969 Strategic Retaliatory Forces, December 6, *FRUS* 1961-1963, Vol. VIII, National Security Policy, Document 151.

[199] Memorandum From the President's Military Representative (Taylor) to President Kennedy (1963), September 23, Program I Memorandum for the President, Digital National Security Archive, Collection on Nuclear History, p. 2. According to the DPM, AD-sufficient forces would be able to retaliate with enough firepower to cause "about a 30% loss of population and 50% loss of industrial capacity" in the Soviet Union. See Draft Memorandum From Secretary of Defense McNamara to President Johnson (1963), Recommended FY 1965-FY 1969 Strategic Retaliatory Forces, December 6, *FRUS* 1961-1963, Vol. VIII, National Security Policy, Document 151, p. 549.

seek to deploy this number by the end of the decade. Anything more, the DPM argued, would permit such little extra usable military power as to lack justification for the cost.

Despite the recognition of the inescapability of mutual vulnerability at the highest levels of government, a turn of events nearly identical to those following the first strategic DPM again showed that this was insufficient to effect change in strategic forces accordingly. Two memos emanating from the White House – one from Bundy's office, the other from the staff of the president's science advisor – criticized the DPM recommendation on the grounds that a smaller force of around 950 Minutemen would be "just as effective as the larger one in causing the Soviets to harden and disperse their own missile forces."[200] Furthermore, the extra 250 missiles in the larger proposal only reduced U.S. casualty figures by a "fairly small difference" of 3 million. Although these arguments were apparently compelling to President Kennedy, he deferred to McNamara's judgment that "1200 was the least he could get away with and still maintain a credible relationship with Congress and the Joint Chiefs."[201] In combination with 1961 budget negotiations, this episode demonstrates the importance of domestic political concessions in determining how a state responds to mutual vulnerability. It might not matter whether some policy actors doubt the lack of strategic advantage offered by quantitative improvements beyond a certain point if there is a more politically persuasive view.

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[200] The discussion in this paragraph is derived from Memorandum From the President's Deputy Special Assistant for National Security (Kaysen) to the President's Special Assistant National Security Affairs (Bundy) (1963), October 25, Comment on DOD Draft Memorandum: Strategic Striking Forces (August 31, 1963), Digital National Security Archive, Collection on Nuclear History; and Memorandum From Spurgeon M. Keeny, Jr., to the President's Special Assistant National Security Affairs (Bundy) (1963), 22 November Budget Meeting with Secretary McNamara, November 22, *FRUS* 1961-1963, Vol. VIII, National Security Policy, Document 147.

[201] Kaplan (1983), p. 257. Kaplan additionally notes this was one of "many occasions" on which "McNamara first came up with the conclusion and then ordered analysis to support it."

The Kennedy Administration and mutual vulnerability: concluding thoughts

The divide among Kennedy's national security leadership on the permanence of U.S.-Soviet mutual vulnerability was clear from early on in the administration and stayed constant for its duration. On the one hand, the secretary of defense, much of the White House staff and the president himself seemed to believe that a U.S.-Soviet nuclear exchange would cause a level of destruction to U.S. society, economy and military capabilities so tremendous as to be "unacceptable." According to this perspective, to attempt to change this through investments in greater numbers of offensive weapons was futile, for any resultant advantage would be fleeting and in the interim, potentially prompt a Soviet reaction. On the other hand, the military services – with some support from within the DOD as well as Congress – had a higher threshold for the level of damage they believed the United States could tolerate. A nuclear war ending with a more severely damaged adversary might be worth fatality levels of 50 million or more. Looking ahead, from their viewpoint a bigger defense budget would ensure such a favorable outcome.

Recognition of the inescapability of the strategic circumstances under Kennedy was more widespread than it had been during the Truman presidency, but was not much greater than it had been during Eisenhower's tenure. For all of the rallying by Kennedy and his advisors about their predecessor's approach to the balance of nuclear forces, their own response to mutual vulnerability was not terribly different. Ultimately the position that the United States could successfully prosecute a nuclear war seemed to shape the trajectory of U.S. forces during this period. That being said, Kennedy officials who did acknowledge the robustness of the strategic circumstances offered the most articulate defense of this position thus far. Much of this has to do with Secretary of Defense McNamara, who vocalized his opposition to reigning ideas about nuclear war outcomes in a way that explicitly called out certain gradations of damage as

unacceptable. And to be fair, McNamara's persistent usage of the logic of diminishing returns to portray the futility of indefinite spending on strategic nuclear forces did place the first notional constraints on the political power of the U.S. military services.

Why did U.S. views about mutual vulnerability exhibit this pattern in the early 1960s? Material and institutional factors seem to have made a difference. At this point in the Cold War story, the technical basis for the enduring nature of the strategic situation was only just seriously coming into view. As detailed in Table 4, strategic assessments under Kennedy reiterated what had become clear several years earlier, namely that nuclear war would probably cause the loss of one-third of the population or more under most conceivable contingencies. At the same time, until close to the end of this administration these same models would also claim that even with such high costs, there could still be a victor. An ISA analysis in 1961 went further, arguing that a U.S. counterforce strike could potentially drive subsequent U.S. population losses down to a level not thought possible since the Truman years (interestingly, casualty figures of this order of magnitude would not be explored in earnest again for another ten years). These numbers seemed to appeal to the military and Nitze, while the president, McNamara, Bundy, and others were more compelled by the high levels of uncertainty and risk inherent in such a finding. The services also had an institutional interest in advocating the tolerability of nuclear war, for arming the United States to take on such an endeavor maintained or augmented their budgets and political influence.

Chapter 5: Mutual vulnerability

during the Nixon, Carter, and Reagan Administrations

Acceptance among Truman, Eisenhower, and Kennedy officials of the strategic situation as inescapable was not widespread, but it was more common in the early 1960s than it had been in the 1940s and 1950s. The following chapter, which examines major decisions on nuclear strategy and capabilities during the second half of the Cold War, demonstrates that this trend continued under Richard Nixon and Jimmy Carter, but not where it mattered most. Though several key members of their administrations believed in the enduring nature of the nuclear balance, a critical few did not. The Reagan years suspended any momentum behind the idea of a robust nuclear balance; dismissal of mutual vulnerability's potential longevity was the norm. As a result, throughout the 1970s and 1980s the United States sought to manipulate the force balance in ways that would recapture the strategic initiative and promise more favorable nuclear war outcomes.[202]

The officials who engineered these decisions believed that by revising the premise of nuclear strategy or spending more money on new strategic offenses or defenses, they could

[202] This chapter omits a discussion of the Lyndon B. Johnson, Gerald R. Ford, and George Bush Administrations. A detailed understanding of mutual vulnerability during their tenures would not greatly change the nature of the overall U.S. reaction to the condition during the latter half of the Cold War. There is believed to be much continuity between the Kennedy and Johnson Administrations in this respect. The approach to nuclear war under Ford reportedly built on the ideas laid out by Nixon's team. Under Bush, war plans remained similar to their predecessors as the urgency of mutual vulnerability faded with the collapse of the Soviet Union. As a result, the critical junctures for U.S. nuclear strategy under Nixon, Carter, and Reagan should suffice to capture the phenomenon of interest. See James E. Goodby (2006), *At the Borderline of Armageddon: How American Presidents Managed the Atom Bomb* (Lanham, Maryland: Rowman & Littlefield Publishers, Inc), pp 102, 107; Matthew G. McKinzie, Thomas B. Cochran, Robert S. Norris, and William M. Arkin (2001), *The U.S. Nuclear War Plan: A Time for Change* (Washington, DC: The Natural Resources Defense Council), pp. 6, 8.

reduce population losses to a tolerable level. For powerful figures in the Nixon and Carter Administrations – namely the national security advisor and secretary of defense – a toll of several million lives was deemed acceptable, at least more so than the minimum U.S. casualties consistently expected by official strategic assessments, which was around 80 million citizens. Reagan officials were outwardly comfortable with a much higher level of casualties than their predecessors, on the order of 40 million lives. These views did not go unchallenged, at least during the first two presidencies analyzed here. Other national security actors raised doubts about the feasibility of keeping casualty levels low and the prospects for victory, as well as the likelihood of achieving any lasting advantage in the strategic arms competition. Such concerns were typically disregarded, only appearing to gain traction after the implications of mutual vulnerability receded as the Soviet Union collapsed in the late 1980s.

The Nixon Administration and NSDM-242

When Richard Nixon assumed the presidency in 1969, the potential severity of strategic nuclear war was incontrovertible. Calculations by U.S. military planners showed that for the foreseeable future the United States would lose at least 40 percent of its population in an all-out exchange "regardless of who strikes first and independent of detailed differences in force level and characteristics."[203,204] Through the early 1970s, U.S. perceptions about the feasibility of damage

[203] Forty percent of the U.S. population amounted to roughly 80 million casualties in the early 1970s. National Security Council Staff (1969), Strategic Policy Issues, circa February 1, in William Burr (2005), ed., *"To Have the Only Option That of Killing 80 Million People is the Height of Immorality": The Nixon Administration, the SIOP, and the Search for Limited Nuclear Options*, (Washington, DC: The National Security Archive), EBB No. 173, Document 2.
[204] Due to the high yields of Soviet nuclear weapons and the concentrated nature of the U.S. populace, calculations by the Joint Strategic Target Planning Staff (JSTPS) showed that under less favorable circumstances the United States might lose up to 70 percent of the population (i.e., about 140 million people in the early 1970s). Minutes of National Security Council Meeting

limitation in the context of global nuclear war were largely consistent with such assessments. Policy-makers saw U.S. nuclear forces as sufficient to guarantee "assured destruction" of the Soviet Union in the event of total nuclear war, but inadequate to promise a tolerable level of damage to home territory.[205] Apart from the Joint Chiefs of Staff, senior officials did not believe in the possibility of a nuclear war in which the United States emerged in a relatively favorable position.[206] "We have no damage limiting capability," remarked Deputy Secretary of Defense David Packard, who was directing the administration's initial assessment of the U.S. military posture, "we depend on retaliating capability as a deterrent."[207] Moreover, the strategic situation was expected to persist. An early internal position paper on the nuclear balance concluded that new capabilities were unlikely to make nuclear war "more satisfactory to us in the event deterrence fails" since both sides had the resources to "offset attempts at significant improvements in offensive and defensive capabilities by the other."[208] President Nixon

(1969), February 12, *FRUS 1969-1972*, Vol. XXXIV, National Security Policy, Document 5, p. 9.

[205] Deputy Secretary of Defense David Packard repeatedly made statements to this effect early on in the Administration. See Notes of National Security Council Meeting (1969), February 14, in folder NSC meeting: Biafra, Strategic Policy Issues 2/14/69 [1 of 2], Box H-020, National Security Council Files, Richard M. Nixon Presidential Library, Yorba Linda, California (hereafter cited as RMNL); Minutes of National Security Council Meeting (1969), February 19, in folder NSC Minutes: Originals 1969 [1 of 5], Box H-109, National Security Council Files, RMNL. For JSTPS support of this position, see Minutes of National Security Council Meeting (1969), February 12, *FRUS 1969-1972*, Vol. XXXIV, National Security Policy, Document 5.

[206] Minutes of Review Group Meeting (1969), May 29, *FRUS 1969-1972*, Vol. XXXIV, National Security Policy, Document 32.

[207] Minutes of National Security Council Meeting (1969), March 6, *FRUS 1969-1972*, Vol. XXXIV, National Security Policy, Document 16.

[208] Paper Prepared by the National Security Council Staff (1969), February, *FRUS 1969-1972*, Vol. XXXIV, National Security Policy, Document 6.

acknowledged as much at the start of his tenure, dismissing his campaign promise of superiority as an advantage that "we shall never have … again."[209,210]

Though the Nixon Administration initially appeared to accept the inescapability of mutual vulnerability, arguments that the balance was robust and superiority was infeasible grew less compelling as Soviet nuclear forces continued to surge. The U.S. quantitative edge in sea-launched ballistic missiles (SLBMs) and heavy bombers was overshadowed by the pace of the Soviet ICBM program, which by 1970 exceeded the missile forces built up under Kennedy and Johnson.[211] Top officials, the president among them, worried that the United States would fall behind as Soviet leaders – uninterested in McNamara's criterion of assured destruction – strove for superiority.[212] Born out of this environment was a delicate consensus that even though nuclear war could not be won, perhaps it could be "managed."[213] By endorsing the concepts of "limited nuclear operations (LNOs)" and "escalation control," Nixon and his advisors thought they could reduce population losses to several million lives, an outcome far more acceptable than

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[209] Richard Nixon (1969), "The President's News Conference," April 18, online by Gerhard Peters and John T. Woolley, The American Presidency Project, University of California, Santa Barbara, available from: http://www.presidency.ucsb.edu/ws/?pid=2004.

[210] Nixon elaborated on this belief in his memoirs several years later. The former president explained that when he assumed office he had already decided that strategic superiority was an elusive and destabilizing objective. See Richard M. Nixon (1978), *RN: The Memoirs of Richard Nixon* (New York: Grosset and Dunlap), p. 415.

[211] May et al (1981), p. 636; Goodby (2006), p. 85.

[212] Nixon was especially worried about being "frozen in" by the pace of Soviet defense programs and was convinced that the Soviet goal was superiority. See Notes of National Security Council Meeting (1969), February 14, in folder NSC meeting: Biafra, Strategic Policy Issues 2/14/69 [1 of 2], Box H-020, National Security Council Files, RMNL. Also helpful in illuminating Nixon's beliefs are handwritten comments on the Administration's initial strategic posture review; see Paper Prepared by the National Security Council Staff (1969), June 5, *FRUS 1969-1972*, Vol. XXXIV, National Security Policy, Document 34. For concern about the Soviet interest in assured destruction at the time, see William E. Odom (2004), "The Origins and Design of Presidential Decision-59: A Memoir," in Henry D. Sokolski, *Getting MAD: Nuclear Mutual Assured Destruction, Its Origins and Practice* (Carlisle, PA: Strategic Studies Institute), p. 175.

[213] Goodby (2006), pp. 98-99.

the minimum of 80 million U.S. casualties envisioned by existing nuclear war plans. In 1974 President Nixon adopted a new nuclear employment policy, National Security Decision Memorandum 242 (NSDM-242), which instructed the DOD and JCS to develop plans and capabilities for conducting LNOs.[214] By setting in motion a process that would ultimately bring U.S. nuclear strategy and forces the closest in line with war-fighting principles they had ever been, NSDM-242 comprised the beginning of an extended attempt to manipulate the entrenched superpower balance in favor of the United States. For the next decade or so, the U.S. approach to the strategic situation would reflect two irreconcilable beliefs about U.S.-Soviet mutual vulnerability: the nuclear balance was enduring, but maybe it could be sidestepped.

The policy laid out in NSDM-242 was predominantly orchestrated by Henry Kissinger, the president's national security advisor and a longstanding proponent of limited nuclear strikes.[215] Kissinger worried that the single type of nuclear option then available to U.S. leaders in a crisis – a massive attack of at least 2500 weapons – was not credible given the Soviet ability to reciprocate even after a U.S. first strike.[216] "No one really believes that we have 'won' if we lose 90 million people and they lose 110 million people," he lamented to his colleagues.[217] Kissinger knew such an outcome was unacceptable from the president's perspective, telling other

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[214] Goodby (2006), p. 98. NSDM-242 was also known as the "Schlesinger Doctrine," given the central role of James Schlesinger, the Secretary of Defense, in promoting the LNO concept to Congress in the mid-1970s. For the NSDM itself, see Memorandum from the President to the Secretary of State, Secretary of Defense, Director, Central Intelligence Agency, and Director, Arms Control and Disarmament Agency (1974), National Security Decision Memorandum 242, June 17, *FRUS 1973-1976*, Vol. XXXV, National Security Policy, Document 30.
[215] Henry A. Kissinger (1957), *Nuclear Weapons and Foreign Policy* (New York: Council on Foreign Relations).
[216] National Security Council, Defense Program Committee (1972), U.S. Strategic Objectives and Force Posture: Executive Summary, January 3, in Burr (2005), ed., EBB No. 173, Document 4, pp. 29, 45.
[217] Minutes of Review Group Meeting (1969), May 29, *FRUS 1969-1972*, Vol. XXXIV, National Security Policy, Document 32.

senior members of the administration "if that's all there is he won't do it."[218] To prevent the Soviet Union from exploiting this opportunity, Kissinger advocated much smaller, more discriminating attack options to use so that a "halt could be negotiated before things escalated to the SIOP level."[219] He argued that this form of damage limitation would reinvigorate the meaning of relative gains in nuclear war; if, for example, the United States lost five million lives and the Soviet Union lost ten million, the outcome of the conflict "might be worth the effort."[220] For Kissinger, there were clearly conceivable nuclear war scenarios where the prospective costs to the United States would be acceptable.

With NSDM-242 Kissinger was ultimately able to secure the codification of this line of reasoning, but it was not an easy process. At the outset of Nixon's tenure, most of the national security bureaucracy agreed that Soviet countermoves would quickly nullify the development of capabilities to support Kissinger's proposal.[221] Senior officials at the Arms Control and Disarmament Agency (ACDA), the CIA, and the Systems Analysis office within the DOD also pointed to the lack of evidence of Soviet interest in limited nuclear attacks.[222,223] Other policy

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[218] Verification Panel Meeting Minutes (1973), Nuclear Policy (NSSM 169), August 9, in Burr (2005), ed., EBB No. 173, Document 22, p. 7.
[219] Odom (2004), p. 177.
[220] Minutes of Review Group Meeting (1969), May 29, *FRUS 1969-1972*, Vol. XXXIV, National Security Policy, Document 32.
[221] Paper Prepared by the National Security Council Staff (1969), June 5, *FRUS 1969-1972*, Vol. XXXIV, National Security Policy, Document 34.
[222] See Memorandum from Adrian S. Fisher to Ambassador Pedersen (1969), February 5, in folder 3, Box H-034, National Security Council Files, RMNL, attachment p. 2; Minutes of Review Group Meeting (1969), May 29, *FRUS 1969-1972*, Vol. XXXIV, National Security Policy, Document 32.
[223] The intelligence community would maintain this position on the lack of Soviet interest in LNOs until the very end of the Nixon Administration. For example, see Draft Memorandum from David S. Brandwein (1973), April 5, in folder NSA, NSC Program Analysis Staff (CODEWORD) (2), Box 55, Ford Library Project File of Documents Declassified Through the Remote Archive Capture (RAC) Program: Photocopies 1969-1977, Gerald R. Ford Presidential Library, Ann Arbor, Michigan. It was not until after NSDM-242 that this view changed.

actors, even those more supportive of the LNO concept, questioned the likely aftermath of U.S. selective strikes. Seymour Weiss, Director of the Office of Strategic Research and Intelligence at State, worried whether a nuclear conflict could really be kept limited; for example, what if the Soviet Union did not back down, instead "slightly upp[ing] the bidding?"[224] Operational feasibility was another issue. The DOD was not optimistic about the survivability of U.S. command, control, and communications (C3) during a protracted nuclear conflict.[225] In summary, Kissinger's colleagues may not have disagreed with the idea of keeping casualty levels low, but there were too many practical questions to secure their total support of the development of LNO-specific capabilities.

Management of nuclear war started to become actual U.S. policy a few years into the administration, when the Department of Defense appeared to respond to White House pressure.[226] Prior to this point, Secretary of Defense Melvin Laird had essentially ignored Kissinger's interest in LNOs, preferring to base deterrence on the assured destruction criteria laid out by his predecessor.[227] For their part, the JCS believed Kissinger's proposal would reduce the U.S. ability to fight and win a nuclear war.[228] Both positions began to change in 1972, when

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[224] William Burr (2005), "The Nixon Administration, the 'Horror Strategy,' and the Search for Limited Nuclear Options," *Journal of Cold War Studies*, Vol. 7, No. 3, p. 58.
[225] This finding was part of a DOD study requested by Kissinger to assess current U.S. capabilities to respond to limited Soviet attacks. See Memorandum from the President's Assistant for National Security Affairs (Kissinger) to the Secretary of Defense (Laird) (1969), National Security Study Memorandum 64, July 8, *FRUS 1969-1972*, Vol. XXXIV, National Security Policy, Document 41. Though the response to NSSM 64 remains classified, some of its conclusions can be found in Burr (2005), ed., EBB No. 173, Document 11, pp. 431-432.
[226] Henry Kissinger (1979), *White House Years* (Boston, MA: Little, Brown and Company), p. 217.
[227] Burr (2005), p. 62.
[228] Specifically, the JCS believed the disaggregation of the SIOP that LNOs would require would result in degraded and less effective war plans. For a list of their arguments, see Memorandum from Laurence E. Lynn, Jr., to the President's Assistant for National Security Affairs

Laird appointed a cohort of high-level Pentagon officials known as the Foster Panel to examine how U.S. nuclear war plans could be made more flexible.[229] This group recommended an array of "sub-SIOP" options that were just what Kissinger had been advocating.[230] The panel laid the groundwork for an NSC-led interagency review of U.S. nuclear policy that (unsurprisingly) saw "limiting damage through the control of nuclear escalation as the most promising approach."[231] This assessment was taking place just as a new Secretary of Defense and avowed advocate of selective nuclear use, James Schlesinger, took up office.[232] With Kissinger and Schlesinger in control of the defense bureaucracy, it was not long before Nixon signed NSDM-242, a move that according to Schlesinger was "designed to blow away the idea of MAD."[233]

As official support for U.S. limited strike capabilities gained momentum, internal resistance persisted but was disregarded or overruled. In December 1973, members of the Coordination and Planning Staff at the State Department conveyed their concerns about the viability of controlled escalation in a letter to Kissinger, who was now serving both as the

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(Kissinger) (1969), The SIOP, November 8, in Burr (2005), ed., EBB No. 173, Document 3, pp. 4-7.

[229] "The Use of Ad Hoc Groups in DOD" (circa 1973) in Burr (2005), ed., EBB No. 173, Document 16.

[230] The panel's findings are still classified, but some information about them can be found in "HAK Talking Points: DOD Strategic Targeting Study Briefing" (1972), July 27 in Burr (2005), ed., EBB No. 173, Document 18. According to Burr, the Joint Chiefs endorsed the Foster Panel report in August of 1972 as "acceptable and in the US interest." After all, the Chairman had served on the Foster panel. Burr (2005), p. 75.

[231] National Security Study Memorandum (NSSM) 169 Summary Report, 4th Draft (1973), April 9, in folder NSSM-169 [3 of 3], Box H-196, National Security Council Files, RMNL, p. 11. For the statement of work for this study, see Memorandum from the President's Assistant for National Security Affairs (Kissinger) to the Secretary of State, Secretary of Defense, Director, Central Intelligence Agency (1973), National Security Study Memorandum 169, February 13, *FRUS 1973-1976*, Vol. XXXV, National Security Policy, Document 4.

[232] For Schlesinger's background, see Kaplan (1983), pp. 372-377. For his retrospective views on NSDM-242, see Burr and Savranskaya (2009), eds., EBB No. 285, Interview with James R. Schlesinger, Document 2 (Volume II), pp. 128-130.

[233] Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Schlesinger, Document 2 (Volume II), p. 129.

secretary of state and as the national security advisor. Chief among their worries was the risk that Soviet leaders might misread the signal(s) that U.S. limited strikes were meant to send.[234] "Deterrence could be weakened," wrote the staffers, "if Soviet leaders should become convinced that we were seeking to construct a wide variety of nuclear escape hatches."[235] Kissinger dismissed these views, responding that it was "good paper though I disagree with much of it."[236] After the NSDM had been written up, NSC director of Program Analysis David Aaron delayed the draft for months, "worried that it opened the flood gates to those in the Pentagon who really wanted a counterforce first-strike policy."[237] Schlesinger overrode the hesitation of Aaron and others at the NSC by unexpectedly announcing the new employment policy at a press conference (without approval from Kissinger), effectively obligating Nixon to sign the NSDM a few days later.

Congress also remained opposed to the idea of LNOs both before and after NSDM-242 was signed. For the duration of Nixon's time in office, U.S. legislators were hostile to notions of strategic superiority and arms racing, and perceived the new policy as a gross departure from the assured destruction-based deterrence strategy that had successfully prevented nuclear war for years.[238] They did not believe that fatalities from a nuclear war could be limited, and sparred

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[234] Memorandum from Winston Lord to the Secretary of State (Kissinger) (1973), NSSM 169 – Nuclear Weapons Policy, December 3, in Burr (2005), ed., EBB No. 173, Document 23, p. 3.
[235] Memorandum from Winston Lord to the Secretary of State (Kissinger) (1973), NSSM 169 – Nuclear Weapons Policy, December 3, in Burr (2005), ed., EBB No. 173, Document 23, p. 4.
[236] Memorandum from Winston Lord to the Secretary of State (Kissinger) (1973), NSSM 169 – Nuclear Weapons Policy, December 3, in Burr (2005), ed., EBB No. 173, Document 23, p. 1.
[237] Kaplan (1983), p. 372.
[238] Peter Pry (2010), *The Role of Congress in the Strategic Posture of the United States, 1970-1980,* Defense Threat Reduction Agency, Advanced Systems and Concepts Office, Report Number ASCO 2010 005, pp. 5, 7, 9, 13-17.

repeatedly with Schlesinger over this question.[239] The Secretary of Defense's testimony following the unveiling of the new policy claimed that a "counterforce strike against the U.S. might result in 'hundreds of thousands' of civilian casualties 'as opposed to tens and hundreds of millions,' which could result from an all-out nuclear exchange."[240] In response to congressional criticism the DOD ended up revising its estimates twice over the next year, ultimately concluding that LNOs could cause between 5 million and 18 million casualties. These corrected figures somewhat undercut Schlesinger's argument that "the likelihood of limited nuclear attacks cannot be challenged on the assumption that massive civilian fatalities and injuries would result."[241]

Despite opposition from many different directions, LNO proponents were able to secure presidential approval. The idea championed by Nixon's national security advisor and secretary of defense – that selective nuclear strikes would be able to drive down population losses from war with the Soviet Union to tolerable levels – became the new premise of U.S. nuclear strategy. Though Kissinger and Schlesinger recognized that neither superpower could win a full-scale nuclear war, they believed there were lower-level situations in which using nuclear weapons could bring about an acceptable outcome at acceptable cost. As such, the Nixon Administration officially codified the rejection of mutual vulnerability as an enduring condition. That being said, it seems that only Kissinger and Schlesinger truly believed the United States could sidestep the U.S.-Soviet strategic situation. The rest of the national security bureaucracy was much more

[239] This paragraph is derived from Pry (2010), pp. 13-17, and Sidney D. Drell and Frank von Hippel (1976), "Limited Nuclear War," *Scientific American*, Volume 235, Number 5, pp. 27, 29, 35.
[240] Drell and von Hippel (1976), p. 27.
[241] Drell and von Hippel (1976), p. 27.

doubtful that the United States could endure any kind of nuclear war but was unable to halt the political momentum behind NSDM-242.

The Carter Administration and PD-59

An entrenched strategic landscape greeted members of Jimmy Carter's administration when they took up their posts in 1977, with official calculations of nuclear war reiterating a familiar bottom line.[242] At the start of Carter's tenure there was agreement within the national security bureaucracy that the nuclear balance of power was relatively stable. The State Department, Office of Management and Budget, ACDA, DOD, JCS, CIA, and NSC agreed the strategic situation was characterized by "rough overall asymmetrical equivalence," or "essential equivalence" for short.[243] In their initial review of the U.S. defense posture senior officials made the now-customary conclusion that neither state could win a general nuclear war and on this basis refuted any interest in first-strike capabilities.[244] They recognized that the balance was

[242] Under the Carter Administration large-scale nuclear war was estimated to cause fatalities "from a low of 20-55 million up to a high of 155-165 million in the United States, and from a low of 23-34 million up to a high of 64-100 million in the Soviet Union." See U.S. Department of Defense (1981), *Report of Secretary of Defense Harold Brown to the Congress on the FY 1982 Budget, FY 1983 Authorization Request*, January 19 (Office of the Secretary of Defense, Historical Office), p. 37. These figures are consistent with an ACDA strategic assessment from earlier in the administration entitled *US and Soviet Strategic Capability Through the Mid-1980's: A Comparative Analysis*. The essential figures from this August 1978 report were reprinted in Holloway (1983), pp. 52-53, 63-64.

[243] Meeting of the Special Coordination Committee (1977), PRM/NSC-10 Comprehensive Net Assessment, July 7, in folder 3, Box 11, Donated Historical Material - Brzezinski, Zbigniew, Jimmy Carter Presidential Library, Atlanta, Georgia (hereafter cited as JCL).

[244] Memorandum from the President's Assistant for National Security Affairs (Brzezinski) to the President (1977), NSC Weekly Report #21, July 15, in folder 9, Box 125, Brzezinski Material: Brzezinski Office File, JCL.

robust enough to "tolerate certain asymmetries," and were initially satisfied with aiming to preserve a ratio of strategic strength "at least as favorable as that that now exists."[245]

But like their predecessors under Nixon, U.S. policy-makers continued to worry that Soviet leaders rejected any notion of a stable strategic situation and were bent on achieving superior nuclear capabilities.[246] Carter and his advisors faced a Soviet arsenal that had grown arguably unchecked for fifteen years, even though the superpowers had signed a strategic nuclear arms control treaty in 1972 and were in the midst of negotiating a follow-on agreement.[247] This contrasted with a coincident lack of turnover in U.S. forces.[248] U.S. perceptions about a "window of vulnerability" with respect to ICBM forces increased markedly in 1978, when the intelligence

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[245] Memorandum From the Acting Assistant Secretary of Defense (Slocombe), to Director of Defense Research and Engineering et al. (1977), U.S. National Strategy (Presidential Directive/NSC-18) (PD/NSC-18), August 30, in William Burr (2012), ed., Jimmy Carter's Controversial Nuclear Targeting Directive PD-59 Declassifed (Washington, DC: The National Security Archive), EBB No. 390, Document 2A; Presidential Decision Memorandum (1977), U.S. Military Strategy and Force Posture, July 22, in folder 1, Box 38, Brzezinski Material: General Odom File, JCL; Meeting of the Special Coordination Committee (1977), PRM/NSC-10 Comprehensive Net Assessment, July 7, in folder 3, Box 11, Donated Historical Material - Brzezinski, Zbigniew, JCL.

[246] These concerns were exacerbated by the arguments of powerful interest groups like the Committee on the Present Danger (CPD) and the "Team B" panel. For the CPD message, see Paul H. Nitze (1976), "Assuring Strategic Stability in an Era of Détente," Foreign Affairs, Vol. 54, No. 2, pp. 207–232. For the Team B report, see U.S. Central Intelligence Agency (1976), *Intelligence Community Experiment in Competitive Analysis, Soviet Strategic Objectives: An Alternative View, Report of Team B,* December, in William Burr and Robert Wampler (2004), eds., "The Master of the Game": Paul H. Nitze and U.S. Cold War Strategy from Truman to Reagan (Washington, DC: The National Security Archive), EBB No. 139, Document 10. For a look at how these groups affected U.S. decision-making, see Robert Scheer (1982), *With Enough Shovels: Reagan, Bush, and Nuclear War* (New York: Random House), pp. 36-65.

[247] The Strategic Arms Limitation Talks (SALT) yielded the first nuclear arms control treaty, SALT I, under Nixon in 1972. Carter and Brezhnev would sign the successor agreement, SALT II, in June 1979 but it would never be ratified. While proponents of arms control argued that these treaties made the Soviet nuclear threat more predictable, critics maintained that they constrained U.S. forces to a far greater extent than their Soviet counterparts.

[248] The United States had not fielded a new land-based ICBM since the Minuteman in the early 1960s. Steven J. Zaloga (2002), The Kremlin's Nuclear Sword: The Rise and Fall of Russia's Strategic Nuclear Forces*, 1945-2000* (Washington, DC: Smithsonian Institution Press), pp. 195-196.

community predicted a tremendous improvement in the accuracy of Soviet missiles.[249,250] As a result the strategic balance was soon expected to shift in favor of the Soviet Union; in the early 1980s the strategic competition would enter a new phase of Soviet dominance, in which U.S. forces would be numerically inferior both before and after a counterforce nuclear exchange, no matter which state got in the first blow.[251] On top of this, evidence was mounting that Soviet military planners were interested in limited nuclear strikes, which served only to reinforce the majority opinion that,

> "the Soviets seriously plan to face the problems of fighting and surviving nuclear war should it occur, and of winning, in the sense of having military forces capable of dominating the post-war world."[252,253]

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[249] Specifically, from 1978 to 1985 the circular area probable (CEP) associated with Soviet missiles was expected to improve from 1500 meters to 600 meters. Christopher Paine (1981), "Running in Circles with the MX," *Bulletin of the Atomic Scientists,* Volume 37, Number 10, pp. 5-6.

[250] Correspondence among national security officials from May 1978 speaks to concerns about the U.S. "window of vulnerability." For example, see Memorandum from the President's Assistant for National Security Affairs (Brzezinski) to the President (1978), NSC Weekly Report #60, May 26, in folder 14, Box 9, Plains File, JCL; Memorandum from Samuel P. Huntington to the President's Assistant for National Security Affairs (Brzezinski), et al (1978), Minutes of the May 15 East-West Planning Group Meeting, May 17, in folder 8, Box 30, Staff Material: Europe, USSR, and East/West, JCL.

[251] Memorandum from the President's Assistant for National Security Affairs (Brzezinski) to the President (1978), NSC Weekly Report #60, May 26, in folder 14, Box 9, Plains File, JCL; Paine (1981), p. 6. For official analysis to this effect, see Memorandum from William E. Odom to the President's Assistant for National Security Affairs (Brzezinski) (1978), The Changing Strategic Military Balance, May 15, in folder 2, Box 6, Brzezinski Material: General Odom File, JCL; Presidential Decision Memorandum from Robert Putnam to the President's Assistant for National Security Affairs (Brzezinski) (1978), Item for Weekly Report, May 26, in folder 8, Box 30, Staff Material: Europe, USSR, and East/West, JCL.

[252] PD/NSC-18: Nuclear Targeting Policy Review (1978), November 1, Phase II Report, Executive Summary, in Burr (2012), EBB No. 390, Document 3; Memorandum from Vic Utgoff to David Aaron (1977), Soviet Views on Limited Nuclear War, October 15, in folder 2, Box 79, Brzezinski Material: Country File, JCL; Memorandum from William E. Odom to David Aaron (1979), Soviet Targeting Doctrine, July 9, in folder 8, Box 58, Brzezinski Material: General Odom File, JCL.

Looking ahead, the central challenge of mutual vulnerability for U.S. policy actors was the Soviet Union's perceived rejection of the idea. As such the Carter Administration set out to spoil the adversary's apparent pursuit of more favorable nuclear war outcomes.[254] Paradoxically, the administration's response to this situation ended up furthering the process initiated under Nixon of providing the president with more defined, limited nuclear options in the event of a crisis. In July 1980 Carter signed Presidential Directive 59 (PD-59), directing the development of many key aspects of a nuclear war-fighting capability, most notably an improved national C3 system so that it stood a better chance of enduring a protracted nuclear conflict.[255,256] Thus the Carter Administration closed on a very different note than the one on which it had opened, in effect planning to attempt to win a full-scale nuclear war.[257]

In a domestic political dynamic similar to the Nixon administration, the impetus behind PD-59 was almost exclusively attributable to Carter's hard-line national security advisor,

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[253] Although the timing suggests a possible connection between Soviet interest in LNOs and the debut of the Schlesinger doctrine, evidence bearing on this relationship is unclear. See Zisk (1993), pp. 82-119.

[254] Memorandum from Samuel P. Huntington to the President's Assistant for National Security Affairs (Brzezinski), et al (1978), East-West Planning Group, August 9, in folder 8, Box 30, Staff Material: Europe, USSR, and East/West, JCL.

[255] Odom (2004), p. 159; PD/NSC-18: Nuclear Targeting Policy Review (1978), November 1, Phase II Report, Executive Summary, in Burr (2012), EBB No. 390, Document 3, p. vii; Memorandum from Jasper Welch to the President's Assistant for National Security Affairs (Brzezinski) (1980), Senate Foreign Relations Committee Paper on PD-59, September 11, in folder P[residential] D[irective] 59 (5/80-1/81), box 35, Donated Historical Material - Brzezinski, Zbigniew, JCL; Kaplan (1983), pp. 383-384.

[256] For the directive itself, see Memorandum from the President to the Vice President, the Secretary of Defense, the Assistant to the President for National Security Affairs, and the Chairman, Joint Chiefs of Staff (1980), Presidential Directive/NSC-59, July 25, in folder Meetings - Muskie/Brown/Brzezinski, 7/80-9/80: Arms Control, Atomic Weapons, box 23, Donated Historical Material - Brzezinski, Zbigniew, JCL. One of the most concise articulations of PD-59's objectives can be found in Memorandum from William E. Odom to the President's Assistant for National Security Affairs (Brzezinski) (1980), The Differences Between PD-59 and NSDM-242, August 22, in folder 3, Box 12, Brzezinski Material: General Odom File, JCL.

[257] Thomas M. Nichols (2014), *No Use: Nuclear Weapons and U.S. National Security* (Philadelphia, PA: University of Pennsylvania Press), p. 36.

Zbigniew Brzezinski.[258] Much like the perceived Soviet position among his colleagues, Brzezinski considered the abilities essential to deterring and fighting a nuclear war to be one in the same. "It is a mistake," he told the CIA director, "to draw the sharp distinction between deterrence and war fighting doctrines."[259] At the core of Brezinski's position was the belief – one shared by his military aide, William Odom, who was also instrumental in the adoption of PD-59 – that "there might well be situations where the capability to reduce damage by perhaps tens of millions of American lives would be far from futile."[260] On this basis both Brzezinski and Odom thought LNOs could allow the United States to manage and prevail in a nuclear war.[261] Odom premised the draft of the PD on his "alternative view of nuclear war," one in which "rapid escalation" was unlikely after the first use of nuclear weapons.[262] According to then-senior NSC staffer Roger Molander, the subsequent advancement of PD-59 through the bureaucratic system was a product of Brzezinski's "insistence," intended to lock in a nuclear strategy tantamount to the continued rejection of mutually vulnerable relations in perpetuity.[263]

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[258] For more on Brzezinski's background, see John Newhouse (1989), *War and Peace in the Nuclear Age* (New York: Alfred A. Knopf), pp. 294-295.

[259] Memorandum from William E. Odom to the President's Assistant for National Security Affairs (Brzezinski) (1980), Reply to Turner on Strategy, September 2, in folder 3, Box 37, Brzezinski Material: General Odom File, JCL. In an interview in the mid-1990s, Brzezinski attributed the same position to the Soviet Union. See Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Brzezinski, in Document 2 (Volume II), p. 16.

[260] PD/NSC-18: Nuclear Targeting Policy Review (1978), November 1, Phase II Report, Executive Summary, in Burr (2012), EBB No. 390, Document 3, p. v.

[261] Brzezinski has confirmed as much since being in office. See Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Brzezinski, in Document 2 (Volume II), p. 17. See also Zbigniew Brzezinski (1983), *Power and Principle: Memoirs of the National Security Adviser, 1977-1981* (New York: Farrar, Straus & Giroux).

[262] Memorandum from William E. Odom to the President's Assistant for National Security Affairs (Brzezinski) (1980), Draft PD on Nuclear Targeting, March 22, in Burr (2012), EBB No. 390, Document 7, p. 4. In retrospect, Odom describes his rationale for PD-59 as the "barest minimum a responsible president could afford to do" to hedge against deterrence failure. Odom (2004), p. 159.

[263] Scheer (1982), p. 11.

Though Brzezinski and Odom were ultimately successful in engineering U.S. policy to fit with their views, they were in the minority when it came to the idea of making nuclear war an acceptable endeavor.[264] Most high-level officials – including the president, Secretary of Defense Harold Brown, and Brown's deputy for policy planning, Walter Slocombe – did not think victory was feasible when nuclear weapons were involved and did not see damage limitation as a legitimate goal.[265] President Carter and his defense secretary had both come into office appearing to accept the inescapability of mutual vulnerability.[266,267] Unswayed by ideas like LNOs and war-fighting doctrines, they originally wanted to discard the Kissinger-Schlesinger legacy altogether.[268] However, Brown reversed his stance after absorbing the conclusions of two reports, the first of which was the Foster study, which had spearheaded the concept of escalation control under Nixon.[269] The second assessment, conducted by the defense department early in the administration, argued that the Soviet leadership valued their own safety more than the population's, and was thus less likely to be deterred by U.S. capabilities to threaten the Soviet

[264] Both Slocombe and Molander attested to this point after they had left the government. Scheer (1982), p. 135.
[265] PD/NSC-18: Nuclear Targeting Policy Review (1978), November 1, Phase II Report, Executive Summary, in Burr (2012), EBB No. 390, Document 3, p. v; Walter Slocombe (1981), "The Countervailing Strategy," *International Security*, Volume 5, Number 4, p. 24.
[266] By many accounts President Carter was less committed to preexisting analytical frameworks when it came to nuclear strategy. He felt that current U.S. nuclear forces far exceeded what was necessary for a robust defense posture, and hoped to reduce U.S. reliance on them. As president-elect Carter had even suggested shrinking U.S. nuclear forces to 200 SLBMs, much to the dismay of the Joint Chiefs. Rowland Evans and Robert Novak (1977), "Nuclear Blockbuster," *Washington Post*, January 27; Goodby (2005), pp. 115-6, 121, 123. See also the president's commentary during an NSC meeting in mid-1979; Minutes from NSC Meeting on Strategic Issues and US-Soviet Relations (1979), June 4, in folder 3, Box 55, Staff Material: Office, JCL.
[267] Brown was more conservative than Carter but had still come into the role of defense secretary an "avowed proponent of the assured destruction school of strategic thought." Odom (2004), p. 178.
[268] Kaplan (1983), p. 383; Goodby (2005), p. 123.
[269] Kaplan (1983), p. 383.

economy and urban centers.[270] As a consequence, though Brown continued to maintain that nuclear war was unwinnable, PD-59's emphasis on targeting the Soviet regime offered a way to deny a Soviet victory and to disabuse Soviet leaders of the notion that they could win a nuclear war.[271] "Employment policy will make its maximum contribution to deterrence," Brown convinced Carter, if it were to "make a Soviet victory, as seen through Soviet eyes, as improbable as we can make it."[272] The Secretary of Defense saw Brzezinski's proposed modification of U.S. nuclear strategy more as a way to mitigate the effects of the Soviet Union's denial of mutual vulnerability's endurance, and less as a deliberate rejection of the condition by the United States.

The policy actors who interpreted Brzezinski's changes to U.S. strategy as an attempt to transcend what they saw as an essentially fixed strategic situation were deliberately blocked from the PD-59 drafting process by the NSC and DOD. For example, Cyrus Vance, the Secretary of State, was more convinced than his colleagues of the robustness of the nuclear balance and believed the idea of waging a protracted nuclear war was "fallacious, and totally unrealistic."[273] During the 1978 DOD targeting review that preceded PD-59, the State Department provided "extensive unsolicited" feedback, warning that "central foreign policy considerations were being

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[270] Memorandum from Reginald Bartholomew to the Secretary of State (Muskie) (1980), US Strategic Nuclear Targeting Policy, August 6, in Burr (2012), EBB No. 390, Document 13, pp. 1-2. Brown would proceed to advance the findings of this report in discussions about nuclear deterrence. For example, see Minutes from Special Coordination Committee Meeting (1979), April 4, in folder P[residential] D[irective] 59 (8/78-4/79), box 35, Donated Historical Material - Brzezinski, Zbigniew, JCL.

[271] Harold Brown (2012), "A Countervailing View," *Foreign Policy*, September 24; Slocombe (1981), p. 24.

[272] Memorandum from the Secretary of Defense (Brown) to the President (1978), Nuclear Targeting Policy Review, November 28, in folder P[residential] D[irective] 59 (8/78-4/79), box 35, Donated Historical Material - Brzezinski, Zbigniew, JCL.

[273] Minutes from NSC Meeting on Strategic Issues and US-Soviet Relations (1979), June 4, in folder 3, Box 55, Staff Material: Office, JCL, p. 2; Scheer (1982), p. 11; Goodby (2005), p. 123.

overlooked."[274] This exchange would comprise State's last involvement with PD-59 for the next two years; subsequent inquiries by senior State officials were "rebuffed" by the NSC and DOD staff. [275] Vance was apparently unaware of the PD when he resigned in April 1980, and his successor Edward Muskie did not find out about the directive until after it had been issued.[276] Another voice of criticism that was excluded from the PD-59 process was the director of the CIA, Stansfield Turner.[277] After the directive had been signed Turner challenged Brzezinski on the "war-fighting pretense" of PD-59, defending the "assured destruction posture" as adequate to "cancel the political and military utility of the Soviet forces."[278]

Nevertheless, Muskie joined Brown and Carter in their efforts to win approval for PD-59-related programs from a dubious Congress (and American public, for that matter).[279,280] Despite Brzezinski's role in drafting the policy, their testimony carefully avoided the national security advisor's views about the directive's intent. PD-59 was vaunted as a "countervailing strategy" in

[274] Memorandum from David Gompert to Gene Martin (1980), Foreign Policy Aspects of PD-59, August 15, in Burr (2012), EBB No. 390, Document 15, p. 6.
[275] Memorandum from David Gompert to Gene Martin (1980), Foreign Policy Aspects of PD-59, August 15, in Burr (2012), EBB No. 390, Document 15, p. 7.
[276] The revelation of State's lack of involvement in the development of PD-59 and the subsequent handling of this gaffe were an embarrassment for the administration. For an overview of this series of events, see Burr (2012), EBB No. 390, Documents 15-19.
[277] Scheer (1982), p. 11.
[278] Turner's objections to PD-59 were the subject of a spirited memorandum from Odom to Brzezinski in late August 1980. Memorandum from William Odom to from the President's Assistant for National Security Affairs (Brzezinski) (1980), Comment on Turner's Comments on Strategic Doctrine, August 30, folder 4, Box 12, Brzezinski Material: General Odom File, JCL.
[279] Pry (2010), pp. 19-21; Odom (2005), p. 195.
[280] State Department documents around the time that PD-59 was issued suggest that the dominant view of the directive at State was similar to that of Secretary Brown. See Memorandum from Reginald Bartholomew to the Secretary of State (Muskie) (1980), US Strategic Nuclear Targeting Policy, August 6, in Burr (2012), EBB No. 390, Document 13; Memorandum from David Gompert to Gene Martin (1980), Foreign Policy Aspects of PD-59, August 15, in Burr (2012), EBB No. 390, Document 15.

that it aimed to repudiate the Soviet concept of victory.[281] Brown and Muskie stressed that the directive did not assume the United States could win a nuclear war, and that it was meant to "complement" McNamara's concept of assured destruction.[282,283] The tone of their testimony demonstrates the widespread intolerance within the United States for attempts to escape the superpower strategic situation.

In the end, PD-59 will be remembered as a pursuit by the United States of more favorable nuclear war outcomes and thus a denial of mutual vulnerability's potential persistence. While the directive's own terms support this image, only a few prominent Carter officials (i.e., the national security advisor) appeared to believe that evading the implications of mutual vulnerability was possible; it just so happened these figures were bureaucratically powerful and savvy enough to successfully turn PD-59 into official policy. The rest of the administration was more inclined to view the end result of a superpower nuclear exchange as unacceptable, regardless of whether it was initiated with a large-scale or limited attack. PD-59 was only palatable for some of this cohort, for example the secretary of defense, who saw the directive as a useful way to counter an adversary bent on achieving strategic superiority.[284]

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[281] U.S. Department of Defense (1981), pp. 38-39; George C. Wilson (1980), "Change in Nuclear Target Policy Not a Radical One, Brown Says," *Washington Post*, August 21. One of the most powerful critiques of the countervailing strategy can be found in Jervis (1984).
[282] Pry (2010), pp. 20-21; Slocombe (1981), p. 19.
[283] Years later Schlesinger criticized Brown for being "less convincing in his public presentations and discussions of the concept," than he himself had been as secretary of defense. Perhaps this was because Brown did not share his predecessor's convictions about the prospects for limited nuclear war. Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Schlesinger, Document 2 (Volume II), p. 129.
[284] Where the president himself came out is still unclear. James Goodby notes that Carter may have been too distracted by the Iran hostage crisis, the Soviet invasion of Afghanistan, and the campaign for his second term. Goodby (2006), p. 123; Nichols (2014), p. 36.

The Reagan Administration, NSDD-13, and SDI

The national security team that President Ronald Reagan assembled was more dismissive of mutual vulnerability as an enduring condition than that which had served under any previous administration. The advantage the Soviet Union was believed to have in the strategic domain was perceived as temporary; ditching Carter's concept of "essential equivalence," Reagan officials made redressing the asymmetric U.S.-Soviet balance a central priority.[285] Moreover, unlike previous administrations there seemed to be general agreement that if the United States really committed itself to the mission of damage limitation, it could reduce the 80 million U.S. casualties that models of nuclear war were predicting at the time to a lower and more acceptable tally of devastation.[286] Accordingly, the first few years of Reagan's tenure featured changes to nuclear strategy and strategic capabilities that in theory promised more favorable nuclear war outcomes for the United States. One of the first major decisions the administration made was to explicitly establish the ability to "prevail" in nuclear war as a primary objective (and thus force-

[285] Meeting of the National Security Council (1982), NSSD 1-82, April 27, in folder NSC 0047 4/27/83 (1), Box 5, Executive Secretariat, NSC: Meeting File, Ronald Reagan Presidential Library, Simi Valley, California (hereafter cited as RRL); Memorandum from Allan A. Myer through Richard T. Boverie to the President's Assistant for National Security Affairs (Clark) (1982), Basic Differences Between Reagan Administration's National Security Strategy (NSDD-32) and Carter Administration's Strategy (PD-18 and PF-62), October 5, in folder NSDD 32 [3 of 4], Box 2, Executive Secretariat, NSC: NSDDs, RRL.

[286] Eighty million casualties would have amounted to roughly one-third of the U.S. population in the early 1980s. Memorandum from the President's Assistant for National Security Affairs (Clark) to the Secretary of Defense (Weinberger) and Chairman of the Joint Chiefs of Staff (Jones) (1982), National Defense/Security Briefings, February 23, in William Burr (2016), ed., Ronald Reagan and Nuclear War: The SIOP Briefing and IVY LEAGUE 82 (Washington, DC: The National Security Archive), EBB No. 575, Document 12.

sizing criterion) for U.S. forces.[287] Just as it had under Nixon and Carter, the premise of nuclear employment guidance continued to evolve towards winning an extended conflict.

With nuclear war officially labeled a survivable endeavor, U.S. acquisition policy focused on improving capabilities along three lines. First, strategic communications were to be modernized so that U.S. nuclear forces could function "before, during, and after a nuclear attack."[288] According to the Air Force general in charge of implementing the program, this decision shifted C3 away from the "idea that there was no way to win a nuclear war exchange" so that U.S. forces would "be able to keep on fighting."[289] Second, a new generation of offensive capabilities was ordered, including the most accurate missiles the United States would ever deploy, the MX ICBM and Trident D-5 SLBM. By the end of the decade, these and attendant advances were expected to roughly triple the U.S. hard-target kill (HTK) capability and boost U.S. "residual capacity" by over 50 percent.[290] The Pentagon estimated these plans would reestablish an arsenal superior to that of the Soviet Union by 1990.[291]

Strategic defenses comprised the third, most critical and controversial area in which the Reagan Administration sought to shore up the U.S. capacity to make nuclear war tolerable.

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[287] Memorandum from the President (1981), National Security Decision Directive (NSDD) 13, October 19, Nuclear Weapons Employment Policy, in NSDDs, 1981-1989, RRL, available from https://reaganlibrary.archives.gov/archives/reference/NSDDs.html.

[288] Memorandum from the President (1981), NSDD 12, October 1, Strategic Forces Modernization Program, in NSDDs, 1981-1989, RRL, available from https://reaganlibrary.archives.gov/archives/reference/NSDDs.html. The president's early plans for improvements to C3 ran upwards of $18 billion; Scheer (1982), p. 32.

[289] Scheer (1982), p. 33.

[290] Specifically, the number of hard targets the United States could destroy was expected to increase from 1200 in 1983 to 3300 in 1989, and U.S. "residual capacity" (or the number of weapons that could remain after a Soviet strike) was expected to increase from 5100 reentry vehicles in 1983 to 8100 in 1989. See Memorandum from the President's Assistant for National Security Affairs (Clark) to the President (1983), DOD's Defense Guidance, FY 85-89, February 8, in folder NSC 00075 25 February 1983 [Defense Guidance, Defense Policy], Box 8, Executive Secretariat, Meeting Files: NSC 71-80, RRL.

[291] Scheer (1982), p. 6.

Substantial investments were made in both passive and active defenses, i.e. civil defenses and BMD, respectively. The priority attached to a passive defense program that could ensure the "survival of the US population even in a protracted general war" resulted in the largest funding commitment to civil defense in over two decades.[292] Encouraged by official exchange calculations that tied the halving of prospective casualty levels to passive defenses, officials authorized evacuation protocols and a blast shelter program that could in theory save 80 percent of the population in the event of nuclear war.[293]

One year later, President Reagan launched the Strategic Defense Initiative (SDI), a research and development program aimed at producing a missile shield capable of defending the United States against a major nuclear attack. Reagan's proposal was much more ambitious than previous attempts to develop active defenses, which after a series of bureaucratic, political and technical challenges had amounted to the deployment of a small number of ground-based interceptors around ICBM silos. In contrast, the SDI program highlighted the potential of "directed-energy" weapons like x-ray lasers that would be based in space.[294] In announcing SDI Reagan proclaimed to his fellow Americans that this suite of technologies had the potential to "intercept and destroy strategic ballistic missiles before they reached our own soil."[295] In other

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[292] Memorandum from the President (1982), National Security Decision Directive 26, February 25, U.S. Civil Defense Policy, in National Security Decision Directives, 1981-1989, RRL, available from https://reaganlibrary.archives.gov/archives/reference/NSDDs.html. This program was projected to cost more than $4 billon before the end of the decade; Congress proceeded to fund the program for roughly this amount. David M. Walsh (2007), *The Military Balance in the Cold War: U.S. Perceptions and Policy* (London, UK: Routledge), p. 77; Scheer (1982), pp. 107, 109.

[293] Memorandum from the President (1982), NSDD 26. According to DOD models of nuclear war, Reagan's civil defense programs could potentially bring U.S. casualties down from 80 million to 40 million. Burr (2016), ed., EBB No. 575, Document 12.

[294] Walsh (2007), p. 80.

[295] Ronald Reagan (1983), Address to the Nation on Defense and National Security, March 23, available from: https://reaganlibrary.archives.gov/archives/speeches/1983/32383d.htm.

words, the president hoped SDI would in time offer a way out of the condition of mutual vulnerability.

Making these changes to U.S. nuclear strategy and forces was a much smoother process under Reagan than under his predecessors since the majority of the foreign and defense policy leadership appeared to have similar views when it came to the feasibility of nuclear war and to the threat posed by the Soviet Union. Indeed, many senior officials had been involved with the Committee on the Present Danger, an organization whose arguments about the nefariousness of Soviet intentions had thwarted progress in arms control negotiations in the late 1970s.[296] During the Reagan years, numerous Committee members were appointed to key positions, including the national security advisor (Richard Allen), the secretary of state (George Shultz), the director of the CIA (William Casey), and the head of ACDA (Eugene Rostow), not to mention the president himself.[297] This group was certain that the Soviet Union was trying to build its way out of a relationship of mutual vulnerability with the United States. Soviet leaders were perceived as uninterested in the idea of a stable force balance, preferring the war-fighting edge that only strategic superiority could deliver.[298]

Reagan policy-makers also seemed to take the feasibility of waging a protracted nuclear war and the ability of U.S. society to recover as self-evident. In discussions about hypothetical conflict scenarios where the end state often included on the order of 80 million U.S. fatalities,

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[296] Scheer (1982), p. 36.
[297] For a detailed list of CPD members with positions in the administration, see Scheer, pp. 144-146. By the end of Reagan's first year in office, roughly one-sixth of CPD's 182 founding members had been brought into the government in some capacity; Ronald E. Powaski (1987), *March to Armageddon: The United States and the Nuclear Arms Race, 1939 to the Present* (Oxford, United Kingdom: Oxford University Press), p. 185.
[298] Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Dr. Fred C. Iklé, Document 2 (Volume II), p. 77; Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Rod McDaniel, Document 2 (Volume II), p. 120.

policy-makers devoted their attention to which factors would enable the quickest recovery.[299] National security officials envisioned conflict going on for years, as one State Department official explained,

> "The war never really stops; it goes on intermittently. One side gradually builds back its communications and its bomber runways. The other side destroys them again, with weapons fired from submarines that have remained on station, and so forth."[300]

The image of an administration at ease with the costs of nuclear war was facilitated by unusually frank comments by members themselves. T.K. Jones, the Deputy Under Secretary of Defense for Research and Engineering, believed the prospective devastation of major nuclear conflict had been overhyped; with sufficient preparation, he predicted that it would only take the United States a few years to bounce back.[301] "If there are enough shovels to go around," Jones famously asserted, "everybody is going to make it."[302] The director of the Federal Emergency Management Agency, the organization that executed the Reagan directives on civil defense, echoed this sentiment, surmising that nuclear war would cause a "terrible mess, but it wouldn't be unmanageable."[303]

In somewhat of a break with the Joint Chiefs' past behavior and mindset, Reagan's top military advisors held more moderate views on how to approach the U.S.-Soviet balance than other senior officials. The Joint Chiefs were concerned about the risks of trying to achieve superiority, particularly given the course of action's potential to reinvigorate the strategic arms

[299] Newhouse (1989), p. 337.
[300] Newhouse (1989), p. 337.
[301] Scheer (1982), p. 18.
[302] Scheer (1982), p. 18.
[303] Scheer (1982), p. 1.

competition.[304] General David Jones, the first Chairman under Reagan, doubted the feasibility of limited nuclear war.[305] He disagreed repeatedly with the position of defense secretary Caspar Weinberger, for example on the desirability of large-scale civil defense program.[306] When Jones retired in mid-1982, he cautioned the administration against preparing for a protracted conflict, a move that he considered akin to "throwing money in a bottomless pit."[307] For the remainder of Reagan's tenure, however, the JCS were less interested in challenging the views of those who believed superiority was within reach, such as Weinberger and his deputy Richard Perle.[308]

With the exception of SDI, the U.S. approach to managing the strategic balance during the first half of the 1980s did not involve substantial input from Reagan himself. Historical accounts portray the president as having a minor role in defense policy during his first term. Indeed, Reagan had not received a full briefing on U.S. nuclear war plans when he signed the series of directives in 1981 and 1982 that put U.S. nuclear forces on a major war-fighting footing.[309] The president preferred to delegate responsibility on these matters to figures like Weinberger and rarely stepped in to mediate interagency disputes.[310,311] To be fair, Reagan's

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[304] Newhouse (1989), p. 340.
[305] George C. Wilson (1982), "Preparing for Long Nuclear War is Waste of Funds, Gen. Jones Says," *The Washington Post*, June 19.
[306] Scheer (1982), p. 108.
[307] Wilson (1982).
[308] Newhouse (1989), pp. 349-350.
[309] Reagan approved the major NSDDs on U.S. strategic forces (namely, NSDD 12 and 13) in October 1981 and signed the civil defense directives (NSDDs 26 and 32) in February 1982. Before late February 1982, Reagan had only received a "superficial brief" on U.S. nuclear war plans. Burr (2016), ed., EBB No. 575, Documents 11 and 12.
[310] Newhouse (1989), pp. 335, 340, 350-351, 370. Indeed, an aide on the NSC staff under Reagan recounted that the president "did not spend much time thinking about the Soviet threat." Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Rod McDaniel, Document 2 (Volume II), p. 120.
[311] For how Reagan's handling of nuclear issues affected the prospects for arms control during his administration, see Strobe Talbott (1984), *Deadly Gambits: The Reagan Administration and the Stalemate in Nuclear Arms Control* (New York: Vintage Books).

views of the Soviet Union were closely aligned with those of his cabinet. He strongly believed that Soviet leaders were serious about fighting a nuclear war, and that their capabilities put them in a better position to do so.[312] But the president did not appear to match his deputies' appetite for nuclear war, as he was something of an idealist. During his first few years in office, Reagan approached his national security team twice about how to abolish nuclear weapons altogether.[313] For Reagan, SDI could liberate the United States from mutual vulnerability, but in a way that involved far less devastation than the post-exchange contingencies discussed by his deputies. That being said, even though Reagan focused more on total defense than damage limitation, like his deputies he believed certain technologies could make the end result of a superpower nuclear exchange tolerable.

By the end of Reagan's first term, the administration was generally pleased with the tactics they had employed to evade a mutually vulnerable relationship with the Soviet Union, and lauded their progress in manipulating the strategic balance. "In the past four years," wrote the top NSC specialist on Soviet matters in mid-1984, "we have managed to halt what had become a worrisome pro-Soviet shift in the global 'correlation of forces'."[314] However, over the course of Reagan's second term the utility and necessity of his early national security directives were increasingly questioned from both inside and outside of the administration. A big driver of this shift was the changing understanding of the Soviet nuclear threat. The "window of vulnerability"

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[312] Scheer (1982), pp. 31, 75.
[313] Newhouse (1989), p. 339.
[314] Special Assistant to the President and Senior Director of European and Soviet Affairs (Matlock) (1984), Dealing with the Soviets, July, in folder Strategy Papers [1984], Box 36, USSR: Subject File, Jack Matlock Files, RRL. See also Memorandum from the President's Assistant for National Security Affairs (Clark) to the President (1983), National Security Priorities – Where Are We Going and How Are We Going to Get There, June 14, in folder U.S.-Soviet Relations Papers Working File: Contains Originals (12), Box 9, USSR: Subject File, William P. Clark Files, RRL.

Reagan had promised to correct had lost credibility; by the late 1980s, the intelligence community had reversed its position on Soviet intentions, concluding that Soviet leaders "would not have high confidence in the capability of their strategic offensive and defensive forces to accomplish all of their wartime missions – particularly limiting the extent of damage to the Soviet homeland."[315] As a result, a major incentive for pursuing a nuclear war-fighting capability faded.

Confidence in the feasibility of Reagan's ballistic missile defense vision also waned, shaken in part by a series of reports disputing SDI's technical viability.[316] As Reagan prepared for the first of a series of summits with the new Soviet leader, Mikhail Gorbachev, the secretary of state urged him to accept the fact that "SDI will not be deployable before the end of your Administration."[317] Yet the president and to a lesser extent his secretary of defense continued to believe that the SDI program could produce an effective area defense system.[318] This optimistic

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[315] Director of Central Intelligence (1987), *NIE 11-3/8-87: Soviet Forces and Capabilities for Strategic Nuclear Conflict Through the Late 1990s: Key Judgments*, in folder Old Strategic NIE's [OA/ID CF01589-001], Box 1 of 2, National Security Council Collection, Richard A. Davis Files, Subject Files, George Bush Presidential Library, College Station, Texas, p. 8; Newhouse (1989), pp. 347, 359. The window of vulnerability, concerns about which had reached an apex under Carter, began to lose legitimacy shortly after Reagan assumed office. Fears really receded in April 1983 with the report of the Scowcroft Commission, a group convened by the president to assess the long-term prospects for the U.S. ICBM force. One of the key conclusions of the Scowcroft report was, in a nutshell, that "America's deterrent wasn't broken and Reagan didn't fix it."

[316] For example, see Memorandum from William H. Taft, IV, to the Assistant to the President for National Security Affairs (Clark) (1987), American Physical Society (APS) Report on SDI (The President's Question at this Morning's NSPG), April 24, in folder NSPG 0151A 04/24/1981 [SDI], Box 5, Executive Secretariat, NSC: National Security Planning Group (NSPG): Records, NSPG 143-170, RRL. Most of the technical community had recognized the impossibility of SDI from very early on.

[317] Memorandum from the Secretary of State (Shultz) to the President (1985), Preparing for Gorbachev, September 19, in folder Arms Control Meeting (01/05/1985-10/29/1985), Box 21A, George Shultz Files, RRL.

[318] For expressions by the president and secretary of defense of their faith in SDI, see Minutes of the National Security Planning Group Meeting (1986), US-Soviet Relations, June 6, in folder

outlook remained at odds with the Joint Chiefs and Congress, who proceeded to shift defense spending away from the more advanced aspects of Reagan's original vision toward more modest technologies that could offer near-term utility, for example like ground-based protection of ICBM silos (not unlike BMD predecessor concepts) or defense against accidental launches.[319] By the end of Reagan's time in office, it was clear that SDI no longer represented the mutual vulnerability escape hatch it had been pitched as some years later.

During the Reagan presidency U.S. nuclear forces were managed by a group of policy officials who rejected the permanence of mutual vulnerability more resolutely than any previous administration. With the right array of investments, Reagan officials seemed to think that the costs of any type of nuclear conflict, be it limited or large-scale, could be made acceptable. In line with this view they made a number of decisions to rectify the U.S.-Soviet nuclear balance, including the revival of strategic defense programs that their predecessors had given up on decades earlier. The end of the Cold War did not appear to make nuclear war or the nuclear arms race any less winnable from the perspective of U.S. policy-makers. Instead, the need to address mutual vulnerability simply receded as the Soviet Union collapsed in the late 1980s.[320] As Reagan's tenure came to a close, there was little agreement over the future of the U.S. nuclear force posture.[321]

NSPG 0134 06/06/1986 [US-Soviet Relations] (2), Box 4, Executive Secretariat, NSC: NSPG: Records, NSPG 110-142, RRL; Minutes of the National Security Planning Group Meeting (1986), US-Soviet Relations, June 12, in folder NSPG 0135 06/23/1986 [US-Soviet Relations], Box 4, Executive Secretariat, NSC: NSPG: Records, NSPG 110-142, RRL; Minutes of the Meeting of Senior Presidential Advisors (1987), The SDI Program, February 3, in folder NSPG 0143 02/03/1987 [SDI, ABM] (2/3), Box 5, Executive Secretariat, NSC: NSPG: Records, NSPG 143-170, RRL. See also "President Demands That Congress Keep 'Star Wars' Alive" (1988), *Associated Press*, March 14.

[319] Weber (1990), p. 76; Newhouse (1989), pp. 390, 403.

[320] Odom (2004), p. 175; Brown (2012).

[321] Newhouse (1989), p. 408.

The U.S. approach to mutual vulnerability in the 1970s and 1980s: concluding thoughts

At no point during the latter half of the Cold War was there a dominant consensus among U.S. officials that any conceivable nuclear war scenario would guarantee an unacceptable level of destruction on home territory. To be fair, an all-out nuclear exchange with the Soviet Union had largely been ruled out as prohibitively costly; this judgment squared well with exchange calculations, which had demonstrated a robust Soviet Union retaliatory capability since the early-to-mid 1960s. At the same time, certain policy officials believed there were situations, some short of large-scale nuclear war, where population losses might be palatable and the United States might very well recover. These perceptions were often rooted in the conviction that the Soviet would understand the meaning and intent behind a U.S. limited nuclear attack, and choose to back down. Another significant factor playing into these assertions was the concern that the United States lacked the tools to deter a Soviet leadership who was not resigned to a robust strategic situation, and instead sought to manipulate the nuclear balance to their advantage. Finally, confidence about the ability of future U.S. capabilities to overcome mutual vulnerability also played a role, especially during Reagan's tenure.

That being said, non-trivial pockets of senior policy-makers during this time did seem to perceive U.S.-Soviet mutual vulnerability as permanent. The view that nuclear war was survivable was far from universal throughout the 1970s. Doubtful that the U.S.-Soviet balance could be upended, several top officials (not to mention Congress) opposed new directives that brought U.S. nuclear strategy and forces closer in line with war-fighting principles. Under Nixon and Carter, challenges came from a number of important entities, including the State Department, the NSC, the CIA, and some parts of the DOD. At the root of their stance was the belief that waging a protracted nuclear war was a fallacious notion. For this group, these

decisions were chasing an unattainable goal and diverted defense spending away from useful priorities and toward a "bottomless pit." Though this view was much less common during the Reagan Administration, it was held by the Joint Chiefs, who reversed their longstanding position that the United States could secure a favorable advantage in nuclear war; the change in their views had ironic timing, as the Reagan cohort would have been more receptive to such an idea than any of their predecessors.

In the absence of general agreement on the inescapability of mutual vulnerability, the United States appeared to choose denial or rejection, primarily because the policy officials who believed nuclear war could be tolerated also had the authority and drive in the 1970s and 1980s to recast U.S. nuclear strategy. With Nixon's signature on NSDM-242, Henry Kissinger, the national security advisor, and James Schlesinger, the secretary of defense, effectively sidelined a fairly resistant national security bureaucracy to elevate LNOs as the building blocks of U.S. deterrence. A similar trend occurred on Carter's watch, with national security advisor Zbigniew Brzezinski embedding in PD-59 the belief that the loss of tens of millions of lives would be a "far from futile" result. To get the directive approved Brzezinski's office enlisted the influence of Secretary of Defense Harold Brown – who saw the PD as a way to offset the Soviet Union's own denial of mutual vulnerability – and shielded the drafting process from figures that would have slowed decision-making down. Under Reagan the national security bureaucracy was for the most part sympathetic to the war-fighting premise of NSDM-242 and PD-59, and as a result passed a number of attendant directives. At the president's insistence a hard push was made for BMD with the explicit objective of giving the United States (and Soviet Union) a way out of the mutually vulnerable dilemma. As the Cold War came to a close, the idea of winning a nuclear

war seemed to fade, less on account of its infeasibility and more because the United States' primary opponent was collapsing.

Chapter 6: Soviet perceptions of mutual vulnerability during the Cold War

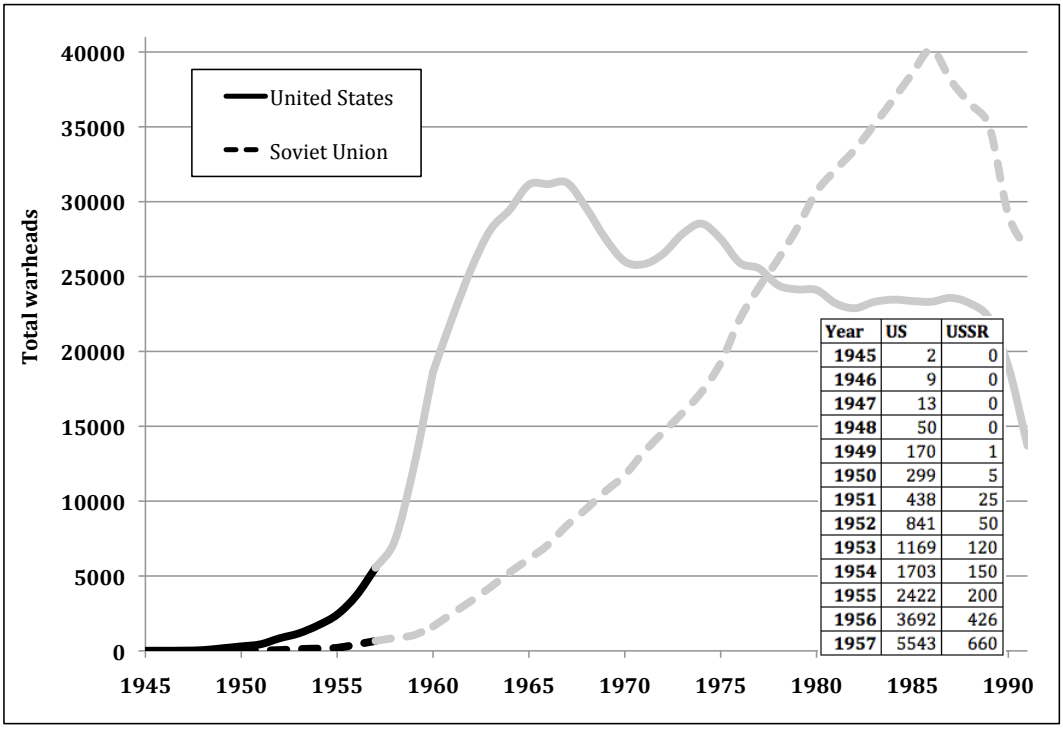
For the Soviet Union, vulnerability to U.S. nuclear attack was a condition to be resisted instead of accepted or embraced. This chapter traces how for over thirty years Soviet leaders maintained that the damage caused by a U.S.-Soviet nuclear war could be managed. In part this was due to the nonexistence or weakness of Soviet strategic assessments. Credible calculations of the effects associated with large-scale nuclear exchanges did not make an impression on the decision-making process until the early 1980s; prior to this point models of nuclear war were either nonexistent or misrepresented to make the costs seem more palatable. In the context of this skewed material picture, as U.S.-Soviet mutual vulnerability emerged and persisted Soviet leaders sought capabilities that they believed would ensure the survival of the Soviet state after a nuclear war.

Under Stalin this meant an emphasis on the conventional elements of military power that had advantaged the Soviet Union in previous wars. During the Khrushchev era, this meant ending Soviet inferiority and shrinking the numerical disparity between U.S. and Soviet nuclear forces. For Brezhnev officials, this meant staying ahead of the United States in the strategic missile competition, even though they "knew, understood, and believed that nuclear use at any level by either side would be catastrophic for the Soviet Armed Forces and the Soviet state they were required to protect."[322] It was not until the early 1980s, as the ideological and bureaucratic backing for the pursuit of Soviet superiority weakened, that the consequences of nuclear war took on an inescapable quality. The notion of a robust strategic balance ultimately found its place

[322] Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Dr. Vitalii Nikolaevich Tsygichko, Document 2 (Volume II), pp. 137-138.

as part of the predominantly defensive strategic concept emphasized by Gorbachev's "new thinking."

1945-1957: growing vulnerability is muted by ideological prophecies[323]



Year	US	USSR
1945	2	0
1946	9	0
1947	13	0
1948	50	0
1949	170	1
1950	299	5
1951	438	25
1952	841	50
1953	1169	120
1954	1703	150
1955	2422	200
1956	3692	426
1957	5543	660

Figure 4. U.S. and Soviet warhead levels under Stalin and Malenkov[324]

[323] This section covers the period between the end of World War II and Nikita Khrushchev's consolidation of power as Soviet premier.

[324] Kristensen and Norris (2013), pp. 81-82. As mentioned in the footnote to Figure 1, note that the plots in Figures 4-7 include both strategic and tactical nuclear warheads. Consequently, a non-trivial portion of the increase in Soviet warhead levels is due to the demand for "battlefield" or tactical weapons, of which the Soviet Union may have deployed close to 25,000; see Majumdar (2016). While the warhead levels depicted in these graphs would be lower if based only on U.S. and Soviet numbers of strategic weapons, the conceptual premise of this dissertation does not depend on the inclusion or exclusion of tactical nuclear weapons in the U.S.-Soviet nuclear balance.

Throughout Joseph Stalin's tenure as leader of the Soviet Union during the Cold War, vulnerability to nuclear attack was a condition that applied overwhelmingly to the Soviet Union. The balance between the strategic nuclear capabilities of the two superpowers was highly asymmetric; after all, a ratio of forces did not exist until 1949, when the crash program Stalin initiated to develop nuclear weapons technology succeeded in producing an operational device.[325] The Soviets subsequently grew their stockpile to about 120 twenty weapons by 1953, but this effort paled in comparison to the concomitant expansion in the United States, which in the same period quadrupled the size of its arsenal, bringing the total close to 1200 weapons.[326] By the mid-1950s, thanks to the availability of U.S. tanker aircraft and an array of foreign operating and staging bases, the United States could attack targets on Soviet territory with almost 2,000 strategic bombers.[327] Soviet intercontinental striking power was not nearly as capable at this time, with around 50 bombers that could only reach the continental United States on one-way missions.[328] The disparity between the nuclear threats presented by Soviet and U.S. forces

[325] For more on Soviet efforts to acquire nuclear weapons technology, see David Holloway (1994), *Stalin and the Bomb: The Soviet Union and Atomic Energy* (New Haven, CT: Yale University Press); Arnold Kramish (1959), *Atomic Energy in the Soviet Union* (Palo Alto, CA: Stanford University Press).

[326] Kristensen and Norris (2013), p. 81.

[327] U.S. strategic aviation plans for 1956 included a long-range bomber force of about 300 B-36s and one wing of B-52s, both of which could fly approximately 5500 kilometers (km) in combat conditions, and about 1600 medium-range B-47s, which could fly over 3200 km. Supporting these capabilities were 720 KC-97 strategic tanker aircraft and over 80 foreign operating and staging bases. Average distances between Russian industrial targets and the closest of these bases to Russian territory ranged from 650 km to 5500 km. A.J. Wohlstetter, F.S. Hoffman, R.J. Lutz, and H.S. Rowenv(1954), *Selection and Use of Strategic Air Bases*, RAND Corporation, Report R-266, pp. 3-7.

[328] For an estimate of the size of the Soviet bomber force at this time, see Lincoln P. Bloomfield, Walter C. Clemens, Jr., Franklyn Griffiths (1966), *Khrushchev and the Arms Race* (Cambridge, MA: MIT Press), pp. 36-39. For the ranges of these aircraft in light of Soviet staging bases and in-flight refueling capabilities, see Central Intelligence Agency (1955), NIE 11-7-55: *Soviet Gross Capabilities for Attacks on the US and Key Overseas Installations and Forces Through 1 July 1958*, June 23, CIA Historical Review Program, Freedom of Information Act Electronic

suggests that while the material basis for mutual vulnerability was emerging during these years, it may have been possible for the United States to escape from it under favorable circumstances.[329]

Although Soviet vulnerability to nuclear attack may have been substantiated by technical characteristics of the balance, Soviet policy-makers evidently did not see things this way.[330] In large part this had to do with the influence of the Marxist-Leninist ideology, which claimed that the Soviet Union would overcome the United States in a future major war. This set of beliefs held that the world was undergoing a socio-political transition from capitalism to socialism; however violent, the struggle would conclude with the victory of the latter over the former. Nuclear war between the Soviet Union (a socialist state) and the United States (a capitalist state) was viewed as a potential part of this historical process. If such a conflict were to occur, Marxist-Leninist theory dictated that the Soviet Union would not just survive, but win. The strategy and capabilities needed to make this happen were merely details, for a victorious outcome was the only result commensurate with the inevitable downfall of capitalism. Given the dominance of ideology over all aspects of Soviet strategy, military planning proceeded on this basis.

Reading Room, paragraphs 8-10. It is also worth mentioning that Stalin had initiated a ballistic missile program, but large-scale deployment would not begin until the early 1960s.

[329] Scholars disagree about how vulnerable Soviet nuclear forces were during the 1950s. For some the United States had a clear disarming capability, but others point out that the small number and low yields of U.S. nuclear weapons detracted heavily from U.S. confidence about the ability to "wage nuclear war successfully …while restricting damage to the West to 'acceptable' levels." See Lieber and Press (2013), p. 13; Betts (1987), pp. 144-145.

[330] The term "policy-makers" in this section refers to Stalin and his closest advisors. The structure and operation of the Soviet government during Stalin's reign was so totalitarian that much of Soviet strategic thought can be captured by considering the decisions and beliefs of this group, if not just the leader himself. May et al (1981), pp. 89, 760; Harriet Fast Scott and William F. Scott, eds. (1982), *The Soviet Art of War: Doctrine, Strategy, and Tactics* (Boulder, CO: Westview Press), p. 74.

However, there were no official strategic assessments to support this depiction of nuclear war. Calculations of prospective nuclear strikes by the United States or of U.S.-Soviet nuclear war were essentially nonexistent under Stalin and for years after his death.[331] Analytical work on the "correlation of forces" focused on retrospective studies of World War II operations.[332] With nuclear weapons shoehorned into frameworks and methodologies created for conventional weaponry, the destructiveness of the new technology went underappreciated. As one influential military scientist recalled, "they basically tried to regard (nuclear weapons) as some new quantitative expression of the chief factor in armed conflict – firepower."[333] Though the unnerving reality of the U.S. monopoly must have been hard to deny, Stalin suppressed additional consideration by the military of "new conditions and factors of armed struggle

[331] Thomas M. Nichols (1993), *The Sacred Cause: Civil-Military Conflict over Soviet National Security, 1917–1992* (Ithaca, NY: Cornell University Press), p. 61.
[332] Peter Almquist and Stephen M. Meyer (1985), *Insights from Mathematical Modeling in Soviet Mission Analysis (Part II)*, Research Report No. 86-8, Soviet Security Studies Working Group, Center for International Studies, Massachusetts Institute of Technology, p.10; Holloway (1994), p. 237. The "correlation of forces" between the Soviet Union and a competitor or adversary was an important factor in this work and more broadly within Soviet strategic thought, but this term ought to be distinguished from the "balance of forces" used so often by U.S. strategists and policy-makers. For Soviet actors, the correlation of forces had both a political and military-technical meaning. The studies mentioned in the text above focused on the military-technical definition, which relies too intently on operational and local variables to be relevant to the current study. Svytoslav Kozlov (1964), "Development of Soviet Military Science After the Second World War," in Scott and Scott, eds. (1982), pp. 91-94; Levy (1992), pp. 11-12, 14-31. The political variant of the correlation of forces has the opposite problem; it is too ambiguous to permit concrete analysis of a given strategic relationship. See Richard E. Pipes (1978), "*Correlation of Forces" in Soviet Usage – its Meaning and Implications*, Technical Note SSC-TN-4383 2, Strategic Studies Center, SRI International; Holloway (1983), p. 82.
[333] John G. Hines, Phillip A. Petersen, and Notra Trulock Iii (1986), "Soviet Military Theory from 1945-2000: Implications for NATO," *The Washington Quartely*, Volume 9, Issue 4, p. 119; Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Gen.-Col. (Ret.) Adrian A. Danilevich, Document 2 (Volume II), pp. 54-55.

connected with the appearance of the nuclear rocket weapon."[334] During his reign it was politically risky to entertain the probable differences between conflicts of the past and the future.[335] Combined with the absence of analytical tools to describe or measure the state of the superpower balance, the stifling of critical thought about Soviet nuclear strategy all but guaranteed an inaccurate picture of the Soviet Union's nuclear position vis-à-vis that of the United States.

At the same time, the perceived advantages of Soviet military power and territory lent credibility to Marxist-Leninist theories. The set of "permanently operating factors" elevated by Stalin's national security strategy focused overwhelmingly on conventional operations and future ground conflict with the United States on the European continent. Success hinged on capabilities or attributes where the Soviet Union already enjoyed (or was believed to enjoy) an advantage, such as division quantity and quality, armaments, command and control, "stability of the rear," and morale.[336] Notably omitted from the discussion were nuclear weapons. The element of surprise was also downplayed, relegated to the group of "transitory factors" that were assumed to matter little to the conduct and course of wars; even if the Soviet Union was attacked with no warning, it was expected to recover and ultimately defeat the aggressor. Soviet territory comprised another asset, with its alleged suitability to absorbing a nuclear attack.[337] According to a career strategist with the Soviet General Staff, the sheer size of the Soviet Union and the

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[334] May et al (1981), pp. 301-304; Holloway (1983), p. 28; Kozlov (1964), pp. 91-94. For more on Stalin and the military, see Nichols (1993), pp. 33-56; Raymond L. Garthoff (1962), *Soviet Strategy in the Nuclear Age,* (New York: Frederick A. Praeger), pp. 61-63.
[335] Wohlforth (1993), p. 107.
[336] Wohlforth (1993), pp. 107-109; Jonathan Samuel Lockwood and Kathleen O'Brien Lockwood (1993), *The Russian View of U.S. Strategy: Its Past, Its Future* (New Brunswish, NJ: Transaction Publishers), p. 30.
[337] Furthermore, the Soviet Union was not unfamiliar with the level of devastation associated with conflict; it had suffered close to twenty million casualties during World War II.

dispersed nature of its population and industry reinforced beliefs during the 1950s about the ability of the Soviet Union to recover from a nuclear conflict.[338,339] Thus Stalin-era optimism about the costs of nuclear conflict was driven partly by beliefs that elements of military power that had benefited the Soviet Union in previous wars could offset the U.S. monopoly, especially while the U.S. nuclear arsenal was seen or touted as somewhat modest.[340]

The perceived tolerability of nuclear conflict proved robust as details of the U.S.-Soviet balance became apparent over the next few years. The interval between Stalin's death and Nikita Khrushchev's rise to power in the mid-1950s was characterized by the progressive presentation of "basic nuclear facts of life" to Soviet military planners.[341] Crystallized by a steady stream of nuclear tests, the official release of atomic information to the Soviet military around 1954 kick started the incorporation of the new capability into strategic plans and programs.[342] As a consequence, almost ten years after the debut of nuclear technology the Soviet defense establishment was just beginning to confront the challenges associated with effectively exploiting it. As this process was taking place, the validity of some Stalinist theories started to lose ground. Major General Nikolay Talensky, then-chief editor of *Military Thought,* the literary

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[338] Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Gen.-Col. (Ret.) Danilevich, Document 2 (Volume II), p. 64.

[339] The General Staff of the Armed Forces of the Soviet Union was the central unit for the development of military theory and policy under the Ministry of Defense. For additional details, see Zisk (1993), pp. 31-46; Sergey M. Shtemenko (1970), "The Officers of the General Staff and Their Work," in Scott and Scott, eds. (1982), pp. 104-108.

[340] What Stalin knew about the size of the U.S. nuclear arsenal is unclear, since the content and quality of Soviet intelligence reports on this matter is not publically available. Moreover, how the Soviet leader chose to handle that information is a matter of debate. Some historians argue that the Soviet leader deliberately downplayed the significance of nuclear weapons to detract from any leverage associated with the U.S. monopoly and boost morale at home. Others maintain that Stalin's low regard for nuclear weapons was based on his conviction that they would not be decisive in a future war. See Hines et al (1986), p 119; Holloway (1983), pp. 27-28; Wohlforth (1993), pp. 109-110.

[341] Kramish (1959), p. 129; Garthoff (1962), pp. 21-32.

[342] Kramish (1959), p. 129; May et al (1981), pp. 301-305.

organ of the Soviet General Staff, published an article questioning the connection between victory and Stalin's set of permanently operating factors.[343] Though this argument initially garnered fierce opposition from the military, it soon seemed to penetrate strategy-making circles. Military doctrine was revised to deemphasize Stalin's permanently operating factors and promote the importance and potentially decisive nature of both nuclear weapons and surprise attack.[344] Nuclear strikes would constitute the opening salvo in a future war, ideally breaking through U.S. forces deployed along the European front so that the traditional "steamroller" of Soviet conventional operations could advance.[345] By 1957, top defense officials were publicly asserting the centrality of nuclear weapons in Soviet strategy, in stark contrast to positions they had taken a few years earlier.[346]

Increasing reliance on large-scale employment of nuclear weapons evidently threw doubt on some of the precepts underlying Soviet strategic thought in the 1950s, but not all of them. Even though a future U.S.-Soviet conflict was now likely to make use of thermonuclear technology, which guaranteed weapons with much higher explosive yields, preexisting convictions about the Soviet ability to limit the damage caused by a nuclear war endured.[347] At the core of these beliefs remained Marxist-Leninist ideology; although there was now some

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[343] An excerpt of this piece can be found in Nikolay A. Talensky (1953), "On the Question of the Character of the Laws of Military Science," in Scott and Scott, eds. (1982), pp. 127-131.
[344] The first law of conflict, a fundamental precept of Soviet military doctrine, now stipulated that the "mass employment of nuclear weapons" would have "decisive importance in a world war." Derivative of this law "stemmed a number of very important principles of operational art and tactics, including surprise." Vasiliy Ye. Savkin (1972), "Basic principles of operational art and tactics," in Scott and Scott, eds. (1982), pp. 153-154.
[345] Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Gen.-Col. (Ret.) Danilevich, Document 2 (Volume II), p. 54-55.
[346] Foreign Broadcast Information Service (1957), "Radio Propaganda Report: Marshal Zhukov on the Nature of a Future War," Current Developments Series, CD.62, April 5, CIA Historical Review Program, Freedom of Information Act Electronic Reading Room.
[347] The United States successfully tested its first hydrogen bomb in 1952, and the Soviet Union followed suit in 1954.

debate about the inevitability of conflict, most Soviet actors were resolute that if war transpired it would end in the defeat of the United States.[348] The degree of Soviet confidence was demonstrated by the treatment of those who contradicted the predominant line espoused by the Communist Party.[349] For example, though some of Talensky's ideas were ultimately accepted, his case had raised the possibility that the Soviet Union might lose a war under certain circumstances. In response to this point Talensky was severely criticized and ultimately lost his job.[350] Traditionally minded groups like party theoreticians and the military were not willing to accept a notion that directly contravened the Marxist-Leninist narrative.

Georgy Malenkov, Stalin's initial successor, suffered a similar fate.[351] His 1954 election address argued that nuclear war would bring about the "destruction of world civilization," which to the disdain of many Soviet conservatives was taken as an acknowledgment of the uselessness of nuclear war.[352] To exacerbate matters, Malenkov proposed a limited nuclear force posture based on the concepts of minimum deterrence and assured retaliation.[353] These actions comprised a distinct divergence from the ideological position espoused by dominant forces in the Soviet government at the time, which favored higher defense expenditures to prepare for a nuclear war. For the military and other conservative factions, though the prospect was unappealing, nuclear war could still be won or lost in a measurable way. The initial exchange

[348] At the Twentieth Congress of the Communist Party in early 1956, Khrushchev had made the provocative point that "war is not fatalistic inevitability." Nichols (1993), p. 62.
[349] May et al (1981), pp. 310-315, 333.
[350] May et al (1981), p. 306.
[351] This paragraph is primarily derived from Roman Kolkowicz (1971), "Strategic Parity and Beyond: Soviet Perspectives," *World Politics*, Volume 23, Number 3, pp. 442-443; May et al (1981), p. 307, 310-315, 333, 340-342; Holloway (1994), p. 332.
[352] One historical account points out that at the time of this speech Malenkov had recently seen a 15-megaton thermonuclear test. Thus the magnitude of the effects of large-scale employment of such technology was likely on his mind. Holloway (1994), pp. 337-338.
[353] Hines et al (1986), p. 119.

might "knock some small, densely populated countries out of the war," but the Soviet Union could avoid this result through the formidable size of its territory, highly dispersed resources, and efforts to minimize the effects of an incoming attack. Malenkov was convinced to recant his views and was eventually demoted.

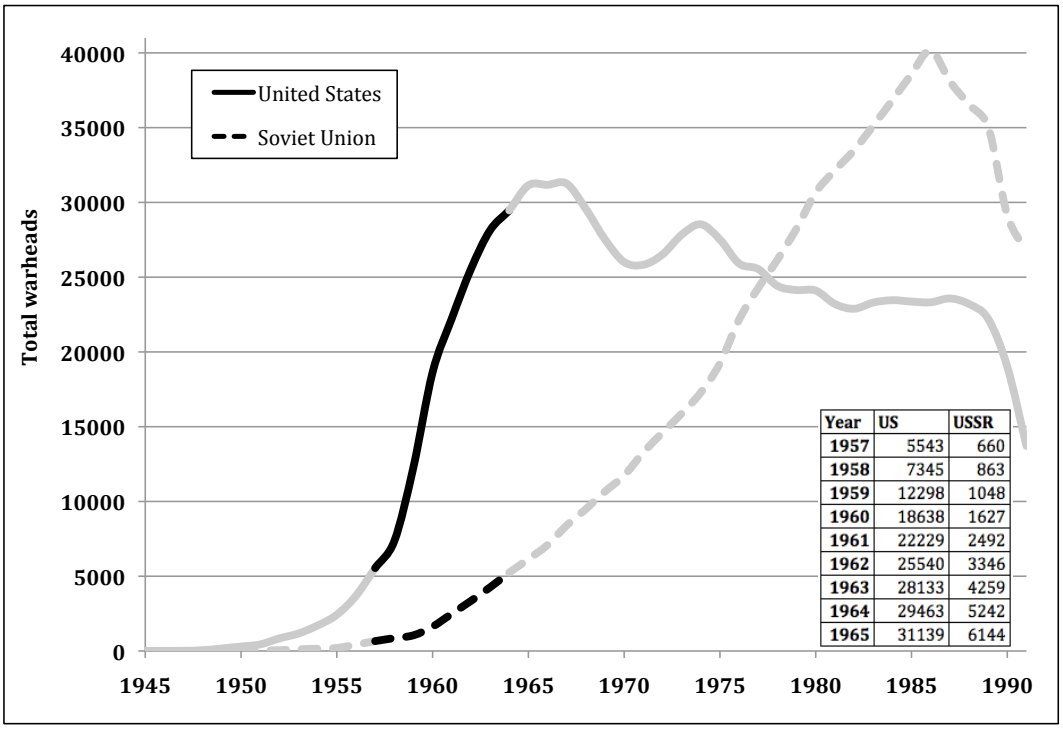
To summarize, the first decade of the nuclear age presented Soviet leaders with a strategic dilemma. They had ended the American nuclear monopoly, but the subsequent asymmetry in intercontinental strike capabilities still put Soviet society, industry and military power at high risk of great devastation in the event of conflict with the United States. It has even been argued that during these years Soviet nuclear forces could have been destroyed by a well-orchestrated U.S. strike.[354] Yet Soviet leaders seemed to respond to this situation without serious concern, wholeheartedly rejecting the notion that mutual vulnerability was an issue, let alone an enduring one. Why? The strongest explanation appears to be rooted in the dominance of the communist ideology. The possibility that a socialist system like the Soviet Union could lose a nuclear war was inconsistent with the core of Marxism-Leninism, which assured eventual triumph over capitalist states like the United States. As the realities associated with nuclear warfare gained traction in the minds of Soviet actors, the means by which the Soviet military would secure this result changed, but the ends remained within the realm of possibility. As nuclear attacks supplanted the conventional land campaign as the decisive mode of combat, interest in fighting a nuclear war remained high.

What's more, Stalin-era analysis of the strategic situation appeared to reinforce Marxist-Leninist prophecies. In part this was due to an incomplete picture of the matchup between Soviet and U.S. intercontinental striking power. During this period there was no institutional capability

[354] Lieber and Press (2013), p. 13.

for strategic assessments, and access to basic information about nuclear weapons' effects and characteristics was largely restricted, even for military planners. Without a realistic understanding of how much damage U.S. nuclear weapons were likely to cause, there was less reason to question the extent to which Soviet conventional superiority could counter American nuclear superiority, especially given the immensity of Soviet territory. As the U.S. stockpile grew to several thousand weapons, Soviet perceptions of the balance were potentially out of alignment with the strategic facts.

1957-1965: leaders reorient nuclear strategy and force posture to end Soviet inferiority[355]



Year	US	USSR
1957	5543	660
1958	7345	863
1959	12298	1048
1960	18638	1627
1961	22229	2492
1962	25540	3346
1963	28133	4259
1964	29463	5242
1965	31139	6144

Figure 5. U.S. and Soviet warhead levels under Khrushchev[356]

[355] This section begins with Khrushchev's rise to power as Soviet premier and ends roughly one year after his 1964 ouster.
[356] Kristensen and Norris (2013), pp. 81-82.

By the time Khrushchev officially succeeded Stalin as head of the Soviet government, the condition of U.S.-Soviet mutual vulnerability was clearer. Soviet bombers could now reach the continental United States on two-way missions due to advancements of in-flight refueling technology.[357] This development enhanced the credibility of the Soviet long-range attacking force, and in doing so put targets on U.S. territory at greater certainty of destruction by Soviet attack. However, from a technical standpoint, the quantitative disparity between Soviet and U.S. forces over the next couple of years kept open a small possibility that the United States might be able to fully destroy Soviet retaliatory assets. In other words, in 1957 it remained questionable whether all conceivable conflict scenarios would result in the Soviet Union causing "unacceptable damage" to U.S. society, economy and military capabilities. Though both superpowers were exposed to the risk of extraordinary nuclear attack by the other, the United States could have reduced its risk under highly favorable attack conditions; the Soviet Union did not have the same option.

Though the existing circumstances heavily favored the United States, policy actors on both sides of the strategic balance believed the growing maturity of Soviet nuclear forces would quickly change this situation. Concerns about this trend prompted the administration of President Dwight D. Eisenhower to attempt to preserve the U.S. strategic margin through a comprehensive buildup of nuclear forces.[358] From the opposite perspective, Soviet leaders had a major reason to expect the balance to shift in their favor. In late 1957, after a decade of research and development, they had successfully harnessed ICBM technology and put the world's first satellite into orbit. Because the Soviet Union was the first of the superpowers to achieve this, the

[357] May et al (1981), p. 317.
[358] In the early 1960s it became clear that these concerns were based on inflated estimates of Russian missile capabilities.

launch of Sputnik was taken as proof to many at home and abroad that Soviet intercontinental striking power was pulling ahead of U.S. capabilities. By offering a chance to tilt the strategic balance away from the United States, this achievement presented a fundamental question to Soviet leaders regarding what kind of nuclear relationship they should seek with the United States. Should they resolve themselves to U.S. superiority, try to match the strategic strength of the United States, or somewhere in between?

Soviet actions over the course of Khrushchev's time in power demonstrate that the existing position of strategic nuclear inferiority became increasingly less acceptable for the leadership during this period. Unease over the U.S. lead in nuclear weapons was at the core of the Soviet premier's saber-rattling tactics in the late 1950s; by inflating Soviet capabilities Khrushchev could neutralize the advantages associated with U.S. nuclear superiority in a way that the actual Soviet ICBM program could not. At the same time, Soviet nuclear strategy was modified to bring large-scale intercontinental and regional preemptive strikes to the fore. Although the more conservative groups within the Soviet government and military likely welcomed this strategy's attention to surviving and winning a nuclear war, the attendant force posture failed to satisfy their demands. After the Cuban Missile Crisis magnified their misgivings about the persistent numerical gap between U.S. and Soviet nuclear forces, Khrushchev – and the more moderate views he represented – was replaced by leaders who were amenable to seeking a nuclear capability aimed at strategic superiority. The mid-1960s nuclear buildup in which this period ended reflects how important it was for the most powerful elements within the Soviet defense establishment to procure the means to escape, rather than accept, the strategic dilemma posed by U.S. nuclear forces.

During the late 1950s Khrushchev worked to devalue the current U.S. strategic edge by exploiting the breakthrough constituted by Sputnik and exaggerating the pace of the Soviet ICBM program. Bragging that the Soviet defense industry was "producing missiles like sausages," for example, the Soviet leader hoped to convince U.S. policy-makers in addition to global public opinion that the flourishing Soviet missile economy negated the quantitative edge of American nuclear forces.[359] Though the reality of the Soviet program was much more modest than what Khrushchev portrayed, the numbers mattered less than the extent to which "the Americans believed in (Soviet) power."[360] Khrushchev's tactics had the intended effect, albeit temporarily. In the absence of U.S. intelligence on Soviet ICBMs that demonstrated otherwise, his boasts stoked U.S. fears of "missile gap" and enhanced concerns about the vulnerability of U.S. bomber forces to a disarming attack.

As the image of Soviet capabilities grew stronger, the process of refining Soviet nuclear strategy began with a review organized by the Ministry of Defense (MOD) on the strategic impact of nuclear weapons and ballistic missiles. By prompting a discussion on how to approach the superpower balance of forces, the exercise revealed a divide among top Soviet officials over the desirability of strategic superiority. Traditionally minded elements within the Presidium and military opposed anything less, given superiority's consistency with traditional military doctrine and deeply rooted aspirations to attain dominance over the West in the military-technical arena.[361] A more moderate group leaned closer to the position espoused by U.S. scholar Bernard

[359] Russian newspapers published the sausage analogy in October 1957. Richard Ned Lebow (1988), "Was Khrushchev Bluffing in Cuba?" *Bulletin of the Atomic Scientists*, April, pp. 41-42.
[360] This was how Khrushchev described his saber-rattling tactics to his son Sergei. Greg Thielmann (2011), "The Missile Gap and Its Progeny," *Arms Control Today*, May 3.
[361] May et al (1981), pp. 340-342; Holloway (1983), p. 44.

Brodie, whose work on deterrence had been studied as part of the review.[362] This cohort was less sanguine than conservatives about the utility of nuclear war, and advocated parity with U.S. forces instead of superiority. A notable member of this group was Khrushchev, whose views had softened as he gained a better understanding of the consequences of nuclear war and of the conflicting economic demands of national defense and domestic programs.[363] Khrushchev's about-face was marked by a 1958 speech in which he predicted a war fought with nuclear weapons would cause "immeasurable harm to all mankind." This statement angered the conservative establishment, which remained committed to the Marxist-Leninist notion that nuclear war could be tolerated as part of the predestined defeat of capitalism by socialism.[364]

The offensive orientation of policy discussions and documents around 1960 underlines the resilience of this conservative orthodoxy. The primary conceptual product of the MOD review focused on waging a nuclear war in the face of hundreds of millions of fatalities worldwide. Authored by a group of strategists under the direction of Marshal Vasily D. Sokolovskii, Chief of the Soviet General Staff, the basis of the recommendation was to mount a nuclear air campaign that would inflict as much damage on the enemy as possible.[365] Though there was some disagreement over whether preparations should be geared toward a war of long

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[362] Scott and Scott, eds. (1982), pp. 125-126. For a list of some of the major Western writings on deterrence theory and strategic thought that had been translated into Russian at this time, see V.D. Sokolovskii, Herbert S. Dinerstein, Leon Goure, and Thomas W. Wolfe (1963), *Soviet Military Strategy: A Translation from V.D. Sokolovskii with Analysis and Annotation by H. Dinerstein, L. Goure, and T. Wolfe*, The RAND Corporation, R-416-PR, pp. 530-533.
[363] Kolkowicz (1971), p. 443.
[364] Kolkowicz (1971), p. 443.
[365] An excerpt of this piece can be found in Vasiliy D. Sokolovskiy (1962), "Military-Strategic Features of a Future World War," in Scott and Scott, eds. (1982), pp. 174-177. For a full translation, see Sokolovskii et al (1963). See also Scott & Scott (1982), eds., pp 158-159; Holloway (1983), p. 38, 40-42, 56.

or short duration, either way the conflict would "naturally end in victory."[366] The official strategy formally unveiled by Khrushchev in 1960 aligned with Sokolovskii's vision. It centered on preemptive nuclear attacks, directed first against the continental United States and then against the length of the European front.[367] Subsequent damage to Soviet assets and the theater of operations was largely disregarded, as conventional ground operations against U.S. and allied forces were expected to advance in the wake of nuclear blows at an estimated rate of up to 60 miles per day.[368] After Sokolovskii's ideas were folded into military doctrine in 1962, Soviet policy on multiple levels was oriented toward winning a war that was widely expected to feature a global exchange of nuclear weapons.[369]

Five years after the launch of Sputnik, Soviet leaders were all too aware that U.S. strategic strength continued to outpace their own. Contrary to Khrushchev's boasting, Soviet ICBM deployments had proceeded slowly. By mid-1962 Soviet Strategic Rocket Forces totaled roughly 30 missiles and were highly vulnerable to attack during the ten or so hours they needed to be readied for launch.[370] Meanwhile, the United States had ramped up its own missile economy in response to the initial shock of Sputnik and uncertainty as to how quickly the Soviet ICBM program was progressing.

Enhancing Soviet insecurities were more accurate portrayals of the balance at home and abroad. The first Soviet comparisons of overall U.S. and Soviet capabilities were developed

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[366] Sokolovskiy (1962), pp. 175-176.
[367] Nichols (1993), pp. 62-64. Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Gen.-Col. (Ret.) Danilevich, Document 2 (Volume II), p. 55.
[368] Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Gen.-Col. (Ret.) Danilevich, Document 2 (Volume II), p. 55.
[369] Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Gen.-Col. (Ret.) Danilevich, Document 2 (Volume II), p. 55.
[370] Burr and Savranskaya (2009), eds., EBB No. 285, Document 2 (Volume I), pp. 29-30. Battilega (2004), p. 158; May et al (1981), pp. 339, 379, 381.

around this time.[371] Though they did not speak to the effects of nuclear attacks, it would have been tricky for such assessments to ignore or finesse the large quantitative advantage of U.S. ICBM forces over Soviet ICBM forces projected for the mid-1960s.[372] Moreover, in a stunning reversal of the trends signified by Sputnik, new intelligence information in the United States revealed that the Soviet Union was actually losing the missile competition. In late 1961, a speech by U.S. Deputy Secretary of Defense Roswell Gilpatric publically evaporated notions of a missile gap, replacing the global image of U.S.-Soviet equality in strategic power with one of U.S. dominance.

One year later, the Cuban Missile Crisis called additional attention to the inferior status of Soviet nuclear forces and set in motion a strategic buildup aimed at correcting the inequality. For members of the Presidium, Khrushchev had caused the country embarrassment by what was perceived as backing down in the face of U.S. pressure. The crisis proceeded to strengthen the influence of those who found the Soviet leader's policies inadequate, namely party and military conservatives. Khrushchev's subsequent focus on domestic needs over defense budgets further dissatisfied this group, leading to his dismissal from power in 1964.[373] The replacement of Khrushchev by the more hard-line and hands-off Leonid Brezhnev as General Secretary resulted in a defense establishment that was more willing and able to seek a nuclear capability based on strategic superiority. Though moderates continued to disagree with this objective on the grounds

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[371] Burr and Savranskaya (2009), eds., EBB No. 285, Document 2 (Volume II), Appendix E, p. 1; Levy (1992), pp. 16, 19-20, 32; Stephen M. Meyer (1983), "Soviet Theatre Nuclear Forces, Part I: Development of Doctrine and Objectives," *The Adelphi Papers,* Volume 24, Issue 187, pp. 37-38; Peter Almquist and Stephen M. Meyer (1984), *Insights from Mathematical Modeling in Soviet Mission Analysis (Part I)*, Research Report No. 86-5, Soviet Security Studies Working Group, Center for International Studies, Massachusetts Institute of Technology.

[372] According to May et al (1981), p. 474, U.S. ICBM forces were projected to reach about 1000 missiles by the mid-1960s, compared to the Soviet Union's 225 missiles.

[373] Kolkowicz (1971), pp. 442-444.

that any relative advantage would be "neutralized in advance" by the U.S. possession of a secure second-strike capability, the dominant view remained focused on forces commensurate to ensuring national survival in the event of nuclear war.[374]

The defense plan laid out by Khrushchev's successors in 1965 aimed at rectifying the inferiority of Soviet nuclear forces. It focused predominantly on producing an intercontinental striking force competitive with that of the United States, and by and large, succeeded; subsequent deployments of second-generation missiles like the SS-9 and S-11 essentially eliminated the quantitative gap between U.S. and Soviet ICBMs by 1970.[375] It also directed the development of a generation of ICBMs that was better suited for a preemptive mission than its predecessors had been. With greater accuracy and the ability to carry multiple independently targetable reentry vehicle (MIRV) warheads, missiles such as the SS-18 and SS-19 promised an improved capability to destroy U.S. ICBM forces in their silos.[376] In combination, the number and types of missiles emphasized by the 1965-1970 plan suggest the Soviet leadership wanted to bring Soviet forces closer in line with the nuclear war-fighting strategy crafted several years earlier. Otherwise, the advantages of keeping pace with or surpassing U.S. forces would have appeared less compelling than the benefits of deterring nuclear war through the maintenance of an assured retaliatory capability.

To review, over the course of Khrushchev's tenure as Soviet leader, the material implications of the Soviet nuclear threat increased dramatically. Though Soviet nuclear forces

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[374] Kolkowicz (1971), pp. 447-448. Kolkowicz argues that in this way, moderate Soviet strategists in the mid-1960s shared similar views to then-U.S. Secretary of Defense Robert McNamara. This is observation is consistent with the account of events by Colonel General Andrian Danilevich, a career officer with the Main Operations Directorate of the General Staff. See Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Gen.-Col. (Ret.) Danilevich, Document 2 (Volume II), p. 21.

[375] Both the SS-9 and SS-11 were liquid-fueled missiles.

[376] Almquist and Meyer (1985), p. 14.

were still at a numerical disadvantage, the arsenal's sheer size by 1964 – comprising around 5,000 nuclear and thermonuclear weapons and close to 500 missiles and bombers of intercontinental range – prohibitively complicated U.S. chances of a successful disarming attack.[377] Thus by the mid-1960s, Soviet strategic strength presented the United States with a reciprocal challenge.

As the inescapability of mutual vulnerability became hard to argue against, the Soviet leadership sought to evade it. High-level decisions during this timeframe point to the prioritization of ending Soviet inferiority and achieving superiority regardless of the realities of the strategic situation. Over the course of the late 1950s and early 1960s, Soviet nuclear strategy and doctrine were oriented toward winning a war that was expected to begin with a massive exchange of nuclear blows. After the Cuban Missile Crisis seemed to further underscore the value of the numerical upper hand, the leadership orchestrated an upgrade of Soviet nuclear forces that promised at least parity with U.S. strategic capabilities and closer alignment with the first-strike posture demanded by strategic plans. These decisions suggest that the dominant domestic factions at this time did not believe in the irrevocable nature of mutual vulnerability. Instead they sought to manipulate the strategic balance in a way that made the costs of nuclear war tolerable. Looking ahead, by deploying many more offensive weapons they thought they could limit the prospective damage from a future nuclear war even further. The strategic balance was not seen as impervious to changes in either side's capabilities, so there was no reason why the Soviet position of inferiority could not be fully rectified, if not reversed.

To understand why Soviet actions during this period reflected an interest in upending the strategic equilibrium, it is important to recognize that Soviet policy actors were still handicapped

[377] Kristensen and Norris (2013), p. 81; May et al (1981), p. 636.

by ambiguous assessments of the superpower balance. The analytical tools of the Khrushchev era focused on static, quantitative comparisons of U.S. and Soviet delivery vehicles and warheads, not on the likely effects of employing those capabilities in a conflict setting. Though the Soviet leadership had to have been conscious of the immense toll that nuclear war would take, they were not forced to confront concrete estimates of how much suffering to expect. As a reference point, U.S. assessments of nuclear war in the early 1960s were projecting over 100 million casualties in both the United States and Soviet Union.[378] In the absence of authoritative strategic assessments, the most important factor behind Soviet behavior was apparently ideology. Major decisions related to Soviet nuclear forces were spearheaded by factions across the political and military leadership and government bureaucracy that by and large maintained victory was possible on Marxist-Leninist grounds.[379] Those who espoused a more moderate take on defense issues and tended to favor a deterrence-based nuclear strategy either lacked a firm grip on decision-making power or were removed from office, as in Khrushchev's case. If U.S.-Soviet mutual vulnerability began to deepen in the mid-1960s, Soviet leaders did not see things this way.

[378] See Memorandum From Leon W. Johnson to the Chairman, Net Evaluation Subcommittee (1963), 1963 Report of the Net Evaluation Subcommittee, National Security Council: Oral Presentation, August 27, *U.S. Declassified Documents Online*; "Summary and Conclusions, 1963 Report of the Net Evaluation Subcommittee, National Security Council," in Burr (2014), ed., EBB No. 480, Document 10A.
[379] Kolkowicz (1971), pp. 447-448. Nichols (1993), p. 73.

1965-1980: strategic realities resonate with analysts but are rejected by most leaders[380]

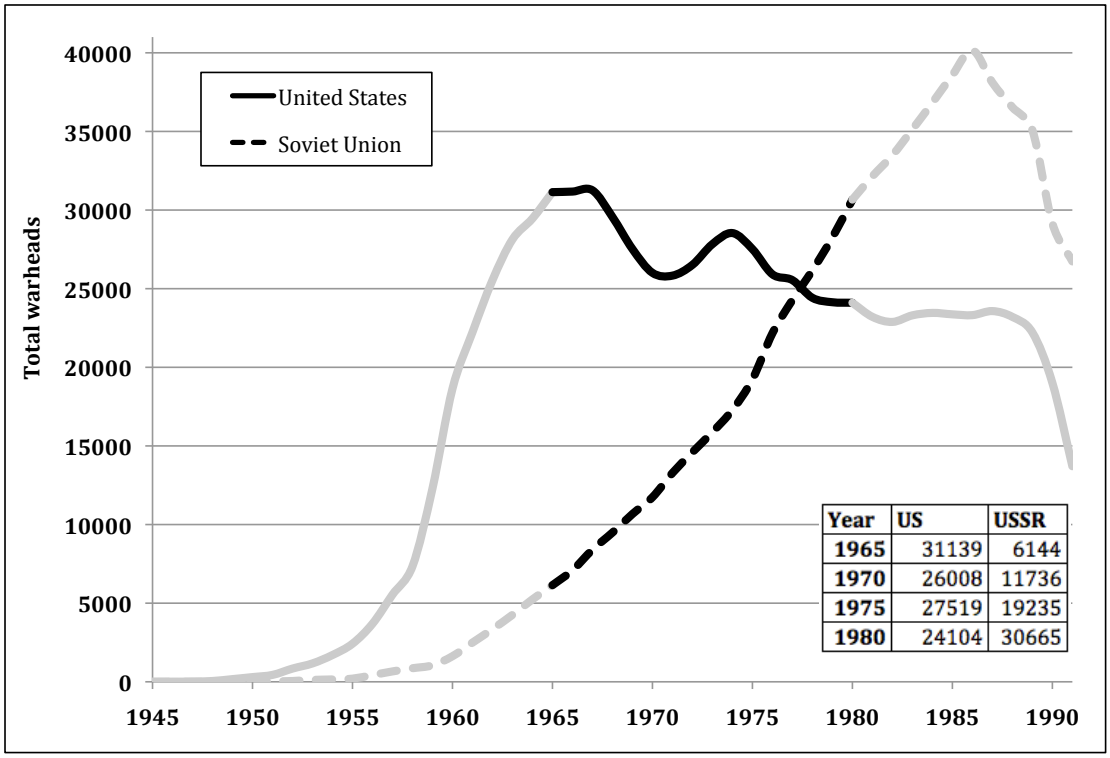

Figure 6. U.S. and Soviet warhead levels under Brezhnev[381]

As the growth of Soviet missile forces further entrenched mutual vulnerability, strategic assessments in the late 1960s and early 1970s provided Soviet policy actors with the first concrete evaluations of the nuclear balance. The "golden age" of quantitative modeling involved analytical assets from the support structures of the Soviet defense establishment (i.e., the MOD and General Staff) and military-industry complex (i.e., the Ministry of General Machine

[380] This section begins with Leonid Brezhnev's assumption of power in 1965 and concludes around 1980.
[381] Kristensen and Norris (2013), pp. 81-82.

Building (MOM)).[382] It did not take long for the burgeoning enterprise to demonstrate the intractable nature of the U.S.-Soviet strategic situation. In the first comprehensive study of nuclear war's consequences, TsNIIMash, the MOM's primary analytical arm, concluded that victory was unachievable regardless of whether the Soviet Union struck first or second. "We have thoroughly worked out … the results of the preventive and retaliatory-meeting strikes," institute director Iu. A. Mozzhorin told the MOD Scientific-Technological Council in 1968, "the war cannot be won."[383] Going into the 1970s, the strategic balance's contradiction with Marxist-Leninist optimism about victory was emerging.

Two subsequent assessment efforts cast additional doubt on the feasibility of waging a nuclear war. Overseen by the General Staff around 1972, both exercises estimated the damage from a nuclear exchange that involved a U.S. offensive and Soviet retaliation. The key question driving the first model, developed by the MOD's Scientific Research Institute Number 6 (NII-6), was the maximum number of weapons that Soviet combat operations could absorb.[384] In its consideration of multiple scenarios in which 2 percent to 25 percent of the arsenals on both sides were employed, NII-6 concluded that even the smallest exchange would make the continuation of conflict "problematical." Moreover, the ensuing radioactive fallout would lead to an environmental disaster and long-term health consequences for the entire Warsaw Pact population. The second exercise examined the effects of a much larger exchange in which the

[382] For a chart depicting the relationship between political, industrial, defense and military entities under Brezhnev, see Burr and Savranskaya (2009), eds., EBB No. 285, Document 2 (Volume I), p. xv.
[383] Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Iu A. Mozzhorin, Document 2 (Volume II), p. 124; see also Zaloga (2002), p. 137.
[384] Discussion of the NII-6 model is derived from Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Dr. Tsygichko, Document 2 (Volume II), p. 124, pp. 139-140, 142; Burr and Savranskaya (2009), eds., EBB No. 285, Document 2 (Volume I), pp. 43-44.

United States used about 70 percent of its nuclear forces.[385] In addition to effectively destroying Soviet conventional capabilities, the attack was expected to cause roughly 80 million Soviet casualties, cripple 85 percent of Soviet industry, and contaminate the European continent with high levels of nuclear radiation. Though embattled, the Soviet response against the United States would be "even more lethal." Consequently, by the early 1970s Soviet leaders had credible evidence that a nuclear war could not be won, and if attempted could claim the lives of around 60 percent of the Russian populace.[386] As the post-Cuban Missile Crisis buildup met its main goal of rectifying the numerical disparity between U.S. and Soviet missile forces, models of nuclear war questioned the utility of this achievement.

Faced for the first time with definitive evaluations of the costs associated with a superpower nuclear exchange, the majority of the Soviet political and defense leadership rejected this information, maintaining that such costs could be driven down to an acceptable level. For example, following a rigorous review of the NII-6 model by General Staff strategists, institute director Vitalii Tsygichko presented the results to Viktor Kulikov, Chief of the General Staff.[387] According to Tsygichko, Kulikov "understood the correctness of his findings but [was] unwilling to accept" them. After the institute director rebuffed Kulikov's demands to alter the model, the NII-6 analysis was assigned a prohibitively high classification rating, effectively preventing any further distribution or debate. Going forward, military exercises continued to underestimate the scale of destruction that ground operations would likely confront in a nuclear war, with

[385] Discussion of the second model is based on Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Gen.-Col. (Ret.) Danilevich, Document 2 (Volume II), pp. 27-28.
[386] The population of the Russia in 1972 totaled about 132 million people. World Bank (2017), "Population, total: Russian Federation," World Bank Open Data.
[387] The remainder of this paragraph is derived from Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Dr. Tsygichko, Document 2 (Volume II), p. 140.

operational plans typically featuring "neat, manageable balloon-shaped contamination patterns that could be circumvented easily by army commanders."

Forceful pushback against the realities illustrated by the second General Staff assessment came from higher levels of the government.[388] The most senior members of the Soviet political leadership participated in this exercise, including Brezhnev, Prime Minister Aleksei Kosygin, and Defense Minister Andrei Grechko. Also taking part in the simulation was Colonel General Andrian Danilevich, a well-respected and long-time officer with the Main Operations Directorate of the General Staff, who described how Brezhnev and Kosygin were "visibly terrified by what they heard."[389] Brezhnev, known for lacking interest and expertise on defense policy matters, was asked to authorize a hypothetical retaliatory strike using a real launch button. "Shaken and pale," the Soviet leader repeatedly solicited Grechko for "assurances that the action would not have any real-world consequences."[390] The impact of this experience on the psyche of political leaders was severe; after 1972 they were no longer engaged in the details of nuclear strategy. This event also led to the distortion of the strategic assessment enterprise. The conclusions of this particular exercise were suppressed, and for the next decade modeling efforts were deliberately manipulated to make nuclear war appear more tolerable:

> For subsequent studies, coefficients were introduced into the models which artificially reduced the level of destruction predicted by the results: a certain percentage of warhead would fail to explode, not hit their targets, the percentage of ecologically "dirty" ground bursts was

[388] This paragraph is derived from Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Gen.-Col. (Ret.) Danilevich, Document 2 (Volume II), pp. 27-29.
[389] Colonel General Danilevich was the richest source of information for the Hines study. Burr and Savranskaya (2009), eds., EBB No. 285, Document 2 (Volume I), p. iii.
[390] Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Gen.-Col. (Ret.) Danilevich, Document 2 (Volume II), pp. 27.

reduced, etc. As a result the picture of nuclear use was artificially made more palatable….[391]

Over the next several years, official strategic assessments would examine the trends in U.S. and Soviet forces without realistic attention to the meaning of the superpower balance in a combat setting.

Ignoring the calculated realities of nuclear war, the Soviet leadership sought forces they believed could manipulate the strategic balance to their advantage. During the 1970s the size of the Soviet nuclear arsenal proceeded to meet and exceed parity with the United States. The growth of Soviet nuclear forces was actually faster and greater at this point than any other time during the Cold War, with the Soviet missile industry outpacing the United States by almost 400 percent.[392] Another central feature of the buildup was the MIRV program, which from 1974 to 1984 basically tripled the number of warheads carried by Soviet missiles.[393] In contrast with the expansion of the 1960s, the core of this buildup comprised missiles that were more appropriate for a first strike, a key element of the war-fighting strategy then being advocated by Grechko.[394]

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[391] Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Gen.-Col. (Ret.) Danilevich, Document 2 (Volume II), pp. 27-28. The manipulation of strategic assessments in this way drove professional analysts out of the Soviet government. In his interview with the Hines team, Dr. Tsygichko described a "steady 'brain drain' of top analysts" from General Staff institutes to the Soviet Academy of Sciences from the mid-1970s onward. Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Dr. Tsygichko, Document 2 (Volume II), p. 140.

[392] Zaloga (2002), pp. 136, 196.

[393] Levy (1992), pp. 22; see pp. 54-59 for missile and warhead data. Pavel Podvig notes that the Soviet Union was "adding about 500 warheads to its ICBM force annually" for at least some of this period; see Pavel Podvig (2008), "The Window of Vulnerability That Wasn't: Soviet Military Buildup in the 1970s – A Research Note," *International Security,* Volume 33, Number 1, p. 119.

[394] Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Mozzhorin, Document 2 (Volume II), pp. 123, 125; Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Boris Aleksandrovich Strogonov, Document 2 (Volume II), p. 132; Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Gen.-Col. Igor' V. Illarionov, Document 2 (Volume

The increased accuracy and MIRVed payload of missiles like the SS-18 and SS-19 put U.S. silos at greater risk of destruction in the event of a Soviet preemptive strike.[395] The Soviet approach to the balance thus remained fundamentally opposed to the idea that mutual vulnerability with the United States would last.

The reaction of Soviet political leaders to nuclear exchange calculations came down to ideological and bureaucratic interests.[396] Key participants in the estimates of early 1970s acknowledge that officials "knew, understood, and believed that nuclear use at any level by either side would be catastrophic," but also that accepting such results would have been devastating for Soviet morale.[397] The leadership needed to adhere to the Marxist-Leninist precept that promised Soviet victory over the United States should a nuclear war come to pass. An integral part of this mindset was a perception that had endured since the Khrushchev era: the nuclear balance was inherently malleable, capable of being tilted or upset by improvements in either side's strategic capabilities.[398] This view complicated the acquisition of forces that could ensure Soviet survival or victory in a nuclear war. Given the adversary's constant ability to overturn the strategic balance, relative gains by the Soviet Union were usually overshadowed by anxieties that those gains would be neutralized. This explains why the Soviet leadership was at most partially satisfied by the achievement of rough parity with the United States in the early 1970s.[399] Their focus instead remained fixated on the "great number of areas where the Soviets

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II), p. 84; Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Vitalii Leonidovich Kataev, Document 2 (Volume II), p. 98.

[395] May et al (1981), p. 661.

[396] Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Dr. Tsygichko, Document 2 (Volume II), p. 138.

[397] Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Dr. Tsygichko, Document 2 (Volume II), p. 137.

[398] Burr and Savranskaya (2009), eds., EBB No. 285, Document 2 (Volume I), p. 1.

[399] Burr and Savranskaya (2009), eds., EBB No. 285, Document 2 (Volume I), p. 1.

were not only behind, but where the U.S. advantage was continuing to grow," particularly with respect to MIRV technology.[400] As a consequence, during Brezhnev's tenure, decisions about strategic forces were premised not on strategic assessments or on evaluations of how particular missile programs might drive down the costs of nuclear war, but "above all by the desire to get ahead of the U.S. competition."[401]

Driving the perceived need for Soviet nuclear forces to "get ahead" of the United States was the military-industrial complex, which by many accounts of the Brezhnev era exerted overwhelming influence over the trajectory of Soviet strategic capabilities and stood the most to gain from their expansion.[402] Because of the Soviet leader's antipathy to issues of defense policy, decisions about Soviet nuclear forces were delegated to subordinates like the Minister of Defense, the Secretary of Central Committee for Defense Affairs, and the chairman of the Military Industry Commission (VPK).[403,404] The lack of high-level political attention led to the rise of the VPK, which in coordination with the military claimed responsibility for defining

[400] Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Gen.-Col. (Ret.) Danilevich, Document 2 (Volume II), p. 22. The U.S. MIRV program lasted from about 1970 to 1974.
[401] Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Gen.-Col. (Ret.) Danilevich, Document 2 (Volume II), pp. 23; Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Kataev, Document 2 (Volume II), p. 97.
[402] The enormous role of Soviet industry in Soviet arms racing behavior was one of the biggest takeaways of the Hines study. Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Dr. Tsygichko, Document 2 (Volume II), pp. 137-143; Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Kataev, Document 2 (Volume II), p. 97; Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Vladimir Rubanov, Document 2 (Volume II), p. 127. See also Podvig (2008), p. 138.
[403] Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Kataev, Document 2 (Volume II), pp. 98-99; Zaloga (2002), p. 137.
[404] VPK is the acronym for the Russian translation of Military Industrial Commission, *Voenno Promyshlennaia Kkomissiia*.

which and how many weapons were needed.[405] Over time, they were able to command much of the decision-making process, "preprogramming" the choices of the political leadership and manipulating government bodies that ostensibly worked for the Politburo, such as the Defense Council.[406] As a result, the expansion of Soviet nuclear forces became an inefficient and partly "mindless" process, with top priority given to the production quotas needed by the defense bureaus to stay operational instead of rational defense needs.[407,408] The structure of decision-making related to the size of the Soviet nuclear arsenal for much of the 1970s was thus highly conducive to attitudes that strategic superiority was attainable and the surest way to ensure a favorable nuclear war outcome.

At the same time, those involved with the strategic assessment process tended to be more convinced that nuclear war would guarantee unacceptable destruction and less optimistic about the utility of seeking superiority in numbers. Disturbed by the war-fighting strategy advocated by Grechko and others, in direct opposition to senior MOM and MOD officials Mozzhorin and his

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[405] Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Gen.-Col. Igor' V. Illarionov, Document 2 (Volume II), p. 83; Burr and Savranskaya (2009), eds., EBB No. 285, Document 2 (Volume II), Appendix E, p. 2.

[406] Zaloga (2002), pp. 203-205; Nichols (1993), pp. 95-96; Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Rubanov, Document 2 (Volume II), p. 127.

[407] Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Dr. Tsygichko, Document 2 (Volume II), pp. 138, 156; Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Kataev, Document 2 (Volume II), pp. 96-97; Burr and Savranskaya (2009), eds., EBB No. 285, Interview with A.S. Kalashnikov, Document 2 (Volume II), pp. 86, 92; Burr and Savranskaya (2009), eds., EBB No. 285, Interview with General Makhmut A. Gareev, Document 2 (Volume II), p. 75; Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Strogonov, Document 2 (Volume II), p. 133; Burr and Savranskaya (2009), eds., EBB No. 285, Document 2 (Volume II), Appendix E, p. 2.

[408] This tendency would consistently lead to the production of multiple variants of the same missile in order to satisfy the different defense bureaus. As Steve Zaloga reports, the Soviet Union deployed "no fewer than 11 ICBMs in no fewer than 20 variants," which was a great deal more than the 4 ICBMs in 6 variants deployed by the United States. It was this type of "inefficient military extravagance" that contributed in large part to the collapse of the Soviet economy. Zaloga (2002), pp. 204-205, 213-214.

institute pushed for reinforcing missile silos as a way to increase the overall survivability of Soviet strategic forces.[409] The results of nuclear exchange modeling efforts also resonated with the General Staff. According to Tsygichko, it was well understood that "absolute catastrophe would be the result of the first day of exchange."[410] The process of quantifying the level of damage attendant to a nuclear war had convinced them that winning was not an attainable prospect.[411] Communist ideology may have stressed the theoretical possibility of Soviet victory, but for the General Staff the practicalities were unworkable.

Consequently, aspects of the Soviet strategic program that fell under or close to the purview of these groups were less congruous with an unabashed drive for strategic advantage. Following years of debate over the merits of survivable ICBMs, a silo-hardening program was approved thanks largely to Mozzhorin's efforts.[412] Increasing the amount of overpressure that

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[409] Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Mozzhorin, Document 2 (Volume II), pp. 122-125.

[410] Burr and Savranskaya (2009), eds., EBB No. 285, Document 2 (Volume II), Appendix E, p. 2.

[411] Battilega (2004), pp. 156, 163; Burr and Savranskaya (2009), eds., EBB No. 285, Document 2 (Volume I), pp. 1, 26; Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Marshal Sergei F. Akhromeev, Document 2 (Volume II), pp. 5-6; Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Dr. Tsygichko, Document 2 (Volume II), p. 145; Burr and Savranskaya (2009), eds., EBB No. 285, Document 2 (Volume II), Appendix E, p. 2; Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Gen.-Col. (Ret.) Danilevich, Document 2 (Volume II), p. 19.

[412] This decision required going against senior MOD and MOM officials, including Mozzhorin's boss, who saw little problem with the force of vulnerable missiles the Soviet Union had amassed in the 1960s and the first-strike posture they implied. The decision to move forward with silo reinforcement seems to have come down to Mozzhorin's efforts to convince Dmitriy Ustinov, a candidate member of the Politburo and secretary of the Central Committee for Defense Affairs. Ustinov was a major power center in Soviet politics, and would go on to succeed Grechko as defense minister in 1976. Burr and Savranskaya (2009), eds., EBB No. 285, Document 2 (Volume I), pp. 26, 32; Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Iu A. Mozzhorin, Document 2 (Volume II), pp. 122-125; Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Gen.-Col. Igor' V. Illarionov, Document 2 (Volume II), p. 84; Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Kataev, Document 2 (Volume II), p. 98;

Soviet silos could withstand from around 30 psi to about 735 psi made the U.S. prospects for a disarming strike less attractive, and the Soviet prospects for a disarming strike less imperative.[413] After advocates of a preemptive strategy were overruled in the "Little Civil War" of the late 1960s, the basis of Soviet nuclear strategy and doctrine began to shift closer to deterrence.[414] In a rejection of the utility of preemptive strikes, the General Staff folded the ideas of "retaliatory-meeting" and retaliatory attacks into nuclear strategy; both of these concepts placed more of an emphasis on a second-strike rather than first-strike posture.[415,416]

To be fair, the General Staff did not fully dismiss the possibility that the Soviet state might survive a nuclear war. In the event that deterrence failed, they focused on damaging the United States as much as possible in the hope that "some 'pockets' of civilization inside the

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Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Strogonov, Document 2 (Volume II), p. 132; Zaloga (2002), p. 137; Podvig (2008), pp. 122-123.

[413] Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Gen.-Col. Igor' V. Illarionov, Document 2 (Volume II), p. 84; Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Gen.-Lt. (Ret.) Nikolai Vasil'evich Kravets, Document 2 (Volume II), p. 110; Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Dr. Tsygichko, Document 2 (Volume II), p. 151.

[414] The "Little Civil War" took place at a special meeting of the Defense Council in July 1969 that was attended by most military, political, and industry leaders. The objective of the meeting was to establish guidance for the development of Soviet forces over the next fifteen years, and essentially pitted advocates of first-strike and second-strike postures against one another. Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Gen.-Col. Igor' V. Illarionov, Document 2 (Volume II), pp. 81-85; Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Iu A. Mozzhorin, Document 2 (Volume II), p. 125; Podvig (2008), pp. 122-123; Zaloga (2002), pp. 135-141.

[415] Battilega (2004), pp. 155; Burr and Savranskaya (2009), eds., EBB No. 285, Document 2 (Volume I), p. 34; Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Gen.-Col. (Ret.) Danilevich, Document 2 (Volume II), p. 64; Raymond L. Garthoff (1990), "Introduction: U.S. Consideration of Soviet Military Thinking," in G.D. Wardak and G.H. Turbiville, Jr., *The Voroshilov Lectures: Materials from the Soviet General Staff Academy, Volume I: Issues of Soviet Military Strategy* (Washington, D.C.: National Defense University), pp. 8, 13.

[416] The difference between "retaliatory-meeting" and retaliatory strikes appears to hinge on the amount of time between the offensive and responding attacks in a nuclear exchange. In a Soviet "retaliatory-meeting" strike, U.S. warheads are incoming or landing during the Soviet launch sequences." A retaliatory attack would take place after a longer interval had elapsed following a first strike. Battilega (2004), pp. 171-172.

Soviet Union" would pull through.[417] But this position was distinct from the offensive underpinnings of Soviet strategy in the early 1960s.[418] By the mid-1970s, General Staff lecture materials on nuclear doctrine explicitly recognized that "in a nuclear war there will be no winner or loser" and stipulated that the Soviet Union would not be the first to use nuclear weapons in a conflict.[419] In fact, their plans did not go beyond the first nuclear blows and did not define ideal post-conflict conditions.[420] The General Staff may have been hedging for the possibility that the Soviet Union could survive a nuclear war, but they were apparently not very confident about it.

Although the General Staff's proximity to nuclear exchange models had brought them closer to accepting the permanence of the strategic situation, their views remained in the minority. In spite of technical evidence that mutual vulnerability had become entrenched, through the 1970s most policy actors involved with the Soviet nuclear program continued to disagree. To maintain morale political leaders continued to uphold ideological claims that the Soviet Union would overcome the United States in a global nuclear war; on this basis they actively suppressed accurate calculations of the balance. They thought greater quantities of heavier nuclear forces could potentially translate into a manageable nuclear war outcome, and were ready to accept even catastrophic levels of damage if it meant the downfall of capitalism.[421]

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[417] Burr and Savranskaya (2009), eds., EBB No. 285, Document 2 (Volume I), p. 26; Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Dr. Tsygichko, Document 2 (Volume II), p. 145.
[418] Garthoff (1990), pp. 10-11.
[419] Garthoff (1990), pp. 10-12; Wardak and Turbiville, Jr. (1990), pp. 70-72.
[420] Burr and Savranskaya (2009), eds., EBB No. 285, Document 2 (Volume I), p. 26; Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Dr. Tsygichko, Document 2 (Volume II), p. 145; Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Marshal Akhromeev, Document 2 (Volume II), pp. 5-6.
[421] According to Col.-Gen. Danilevich, "We considered that we held advantages in certain areas, such as throw-weight, land-based systems, in control systems, in silo protection, in number of weapons, so we thought that we could win a nuclear war by striking at the Americans and then using our general superiority to bring the nuclear war to victory." Burr and Savranskaya (2009),

The pursuit of a superior nuclear arsenal was also promoted by the VPK and the defense industry, which had a powerful role in force posture decisions under Brezhnev. Thus, due to a combination of ideological and bureaucratic factors, the Soviet Union remained largely intent on seeking to liberate itself from the strategic dilemma posed by mutual vulnerability.

The 1980s: resignation to U.S.-Soviet mutual vulnerability grows as drive for superiority weakens[422]

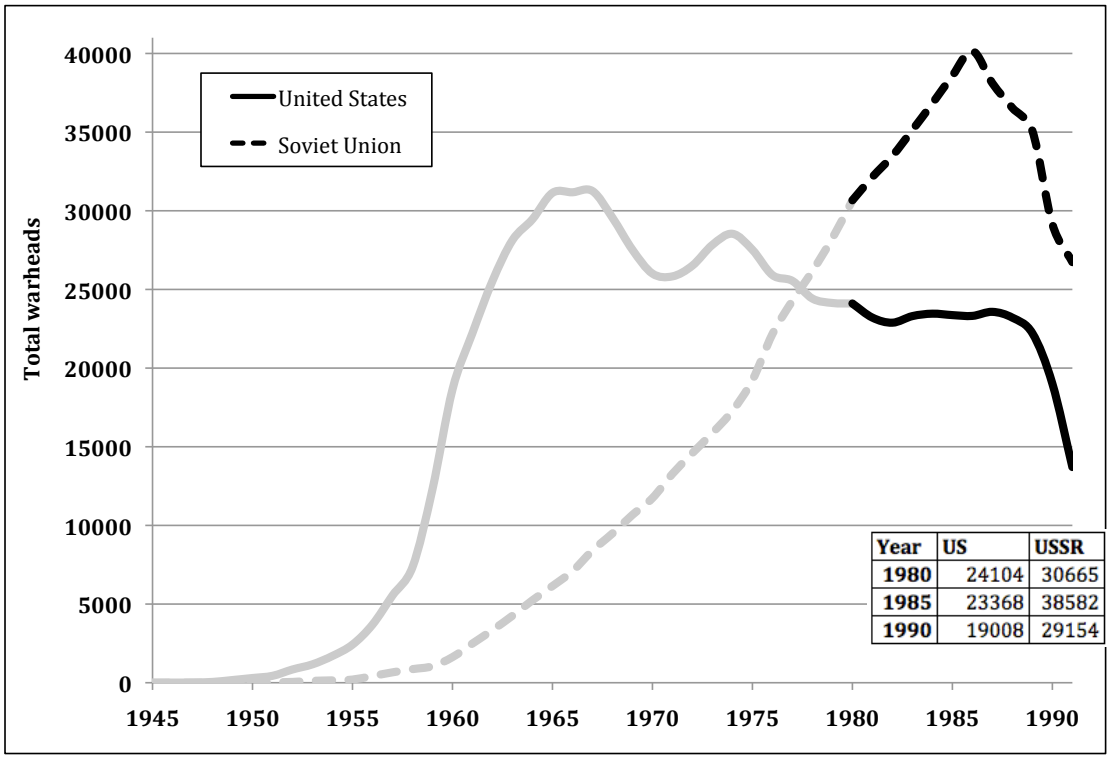

Figure 7. U.S. and Soviet warhead levels during the 1980s[423]

eds., EBB No. 285, Interview with Gen.-Col. (Ret.) Danilevich, Document 2 (Volume II), pp. 28-29.

[422] This section begins in 1980, two years before Brezhnev's death; continues through the tenures of General Secretaries Yuri Andropov, Konstantin Chernenko, and Mikhail Gorbachev; and culminates with the collapse of the Soviet Union in the late 1980s.

[423] Kristensen and Norris (2013), pp. 81-82. Note that these figures include deployed, non-deployed, strategic and tactical nuclear warheads.

By the early 1980s, U.S. and Soviet nuclear forces had their respective technical advantages. The Soviet Union fielded more strategic nuclear delivery vehicles, with heavier payloads; U.S. forces were more accurate and carried a greater number of nuclear warheads.[424] However these distinctions had blurred for Soviet policy actors, whose attitudes about the balance had changed over the previous few years. The leadership now recognized that their ability to inflict an intolerable level of destruction on the United States was assured under any conceivable circumstances.[425] Even if the Soviet Union was the victim of a preemptive attack, they believed they could retaliate in a way that U.S. policy-makers would find unacceptable.[426] The converse was also accepted. After more than ten years nuclear exchange models had finally made their way into policy circles, evidently convincing the political and military leadership that surviving nuclear war was not a realistic expectation.[427] With opposing nuclear forces in the tens of thousands, there was no way either state could exploit the numbers to their advantage:

> A first strike could take out 50, 60, 80%, but the remaining 10% would be enough to completely put out of commission all elements of the viability of a state, and put that state to death. Under any scenario of actions, the damage was unacceptable.[428]

[424] See Levy (1992), pp. 54-59, for longitudinal missile and warhead data.
[425] Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Gen.-Col. (Ret.) Danilevich, Document 2 (Volume II), pp. 28-30, 41.
[426] Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Gen.-Col. (Ret.) Danilevich, Document 2 (Volume II), pp. 28-30, 41.
[427] Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Gen.-Col. (Ret.) Danilevich, Document 2 (Volume II),, pp. 23-25, 29.
[428] Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Gen.-Col. (Ret.) Danilevich, Document 2 (Volume II), p. 29. See also Raymond L. Garthoff (1988), "New Thinking in Soviet Miliary Doctrine," *The Washington Quarterly*, Volume 11, Number 3, p. 133.

The possible environmental effects of nuclear war – collectively known as "nuclear winter" in the United States – were another major concern.[429] The climatic consequences "came to be perceived as the death of civilization and the death of the Soviet Union," noted Danilevich.[430] The Chernobyl nuclear accident reinforced this perception in 1986, when the destruction of a power reactor contaminated a large swath of Soviet territory with high levels of radiation.[431] The evidence that Soviet leaders could not restrict the damage from a nuclear war was overwhelming. Though Soviet leaders did not welcome the condition of mutual vulnerability, they seemed to have resigned themselves to its endurance.

At the same time that the inescapability of the strategic circumstances was gaining recognition, the ideological and bureaucratic backing for the pursuit of Soviet superiority weakened. In the early 1980s, reforms aimed at curbing the influence of the Soviet defense industry took effect; spearheaded by the defense minister Dmitriy Ustinov, an advocate of survivability, these measures sidelined elements within the Soviet ICBM establishment that had aligned themselves with Grechko, his predecessor.[432] Though the military continued to gain power, its influence was soon threatened with the selection of a new Soviet leader who had little

[429] As far as the open literature is concerned, both U.S. and Soviet scientists became interested in the theory of nuclear winter in the early-to-mid 1980s; see Owen B. Toon, Alan Robock, and Richard P. Turco (2008), "Environmental consequences of nuclear war," *Physics Today*, Volume 61, Issue 12, p. 37. In his interview with the Hines team, Dr. Tsygichko claimed General Staff analysts had researched this issue twenty years earlier; see Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Dr. Tsygichko, Document 2 (Volume II), p. 139.
[430] Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Gen.-Col. (Ret.) Danilevich, Document 2 (Volume II), pp. 29, 64.
[431] Zaloga (2002), p. 205. Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Gen.-Col. (Ret.) Danilevich, Document 2 (Volume II), p. 25.
[432] Zaloga (2002), pp. 138-139, 181; Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Gen.-Col. Igor' V. Illarionov, Document 2 (Volume II), pp. 80-83.

regard for or affiliations with military-technical matters.[433] Mikhail Gorbachev assumed the position of General Secretary in 1985 with the intention of revitalizing and reforming the Soviet economy and industrial base, a significant roadblock to which was defense spending.[434] The tactics Gorbachev subsequently used to wrest control of national security agenda from the military bureaucracy, a set of concepts collectively known as "new thinking," diluted the ideological imperative of victory in nuclear war. Free from the "conceptual ideological baggage that so heavily influenced Soviet defense policy in the past," the new thinking paradigm rejected many Marxist-Leninist precepts about nuclear war and established the prevention of conflict as the central objective of Soviet military doctrine.[435] As a result, by the late 1980s there was much more political freedom to accept the strategic dilemma posed by mutual vulnerability, rather insisting on possibility of escaping from it.

During the final decade of the Cold War, Soviet strategic forces and doctrine increasingly appeared to prioritize assured retaliation over achieving superiority. Though the completion of the MIRV program and institutional inertia within the defense industry perpetuated the upward trajectory of the Soviet arsenal through the early 1980s, the growth of Soviet striking power relative to U.S. nuclear forces began to lose momentum.[436] The Soviet quantitative lead in strategic missiles essentially stagnated, while improvements in the accuracy of U.S. forces dramatically enhanced their effectiveness.[437,438] Moreover, traditional anxieties about the U.S.

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[433] Zaloga (2002), pp. 202-203; Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Gen.-Col. (Ret.) Danilevich, Document 2 (Volume II), p. 43; Nichols (1993), pp. 114-115.
[434] Nichols (1993), pp. 162-204; Stephen M. Meyer (1988), "The Sources and Prospects of Gorbachev's New Political Thinking on Security," *International Security,* Volume 13, Number 2, pp. 125, 128-129; Zaloga (2002), p. 204.
[435] Meyer (1988), pp. 125, 130, 134, 155-156.
[436] Zaloga (2002), p. 178.
[437] For the duration of the 1980s the Soviet Union deployed about 2400 strategic missiles (1400 ICBMs and 1000 SLBMs), while the United States deployed about 1650 strategic missiles (1000

ability to overturn the strategic balance were dealt with somewhat differently than in the past. Concerns now centered on U.S. investments in both highly accurate offenses and strategic defenses, and were made particularly acute by continued vulnerabilities in the Soviet nuclear command and control system, which "remained the Achilles heel of Soviet strategic forces."[439] Instead of countering U.S. advancements primarily by trying to outpace the United States and field greater numbers of Soviet weapons, the "mobility of the land-based ICBM force became the primary innovation" of the generation of missiles deployed during the 1980s.[440] Relative to their silo-based counterparts, platforms like the SS-24 and SS-25 were more likely to survive a first strike because of the challenges involved in continuously tracking large numbers of them at the same time. As the overall survivability of the Soviet arsenal increased, it became better suited for preventing a nuclear war than waging one.

ICBMs and 650 SLBMs). See Levy (1992), pp. 54-59. The U.S.-Soviet Strategic Arms Limitation Talks (SALT), and ensuing nuclear arms control treaties of SALT I and SALT II, played a role in constraining the growth of Soviet missile forces.

[438] According to a senior advisor for the Politburo defense industry department, these improvements were believed to increase the "effective power of the U.S. nuclear arsenal by a factor of three." Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Kataev, Document 2 (Volume II), p. 100. These improvements were most notable in the development of the MX ICBM and Trident D5 SLBM; see Donald MacKenzie (1990), *Inventing Accuracy: A Historical Sociology of Nuclear Missile Guidance* (Cambridge, MA: MIT Press), pp. 240-295, 427-434. See also Nichols (1993), p. 172.

[439] Zaloga (2002), p. 196. This anxiety were rooted in the apparent emphasis on "decapitation strikes" in U.S. targeting policy, which Jimmy Carter had recently revised with Presidential Directive 59 (PD-59), as well as the potential of the SDI ballistic missile defense system proposed by Ronald Reagan in 1983. Dmitry Dima Adamsky (2013), "The 1983 Nuclear Crisis – Lessons for Deterrence Theory and Practice," *Journal of Strategic Studies*, Volume 36, Issue 1, p. 12; Burr and Savranskaya (2009), eds., EBB No. 285, Document 2 (Volume II), Appendix E, p. 2; Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Marshal Akhromeev, Document 2 (Volume II), p. 6.

[440] Zaloga (2002), pp. 179, 183-186; Podvig (2008), p. 135.

The change in the composition of Soviet nuclear forces occurred as the foundation of Soviet nuclear doctrine continued to move away from preemptive attacks.[441] With revised perceptions about the credibility of the Soviet second-strike forces and the costs of nuclear war, U.S. theories of escalation control generated interest among Soviet decision-makers in "distanc(ing) ourselves from the nuclear threshold." In a maneuver likened to the Flexible Response policy of the Kennedy Administration, around 1980 the ideas of limited nuclear strikes or "dosage nuclear responses" were developed. For the Soviet General Staff, these more "realistic and rational" alternatives were a far cry from the "'naïve' expectations of facile use on the battlefield and 100km advance rates" that had dominated doctrinal conversations under Khrushchev. The shift in doctrine was cemented in the 1980s by the official renunciation of the preemptive strike, leaving retaliation as the only option.[442] Encouraged by Gorbachev's reforms, by the end of the Cold War Soviet nuclear policy rested on a predominantly defensive strategic concept and emphasized the avoidance of nuclear war.[443]

The Soviet approach to mutual vulnerability: concluding thoughts

From the late 1940s the United States had deployed enough capability to devastate Soviet territory in the event of nuclear war; by the mid-1960s Soviet strategic power ensured that nuclear war would cause the destruction of both superpowers. Yet for the bulk of the Cold War, predominant Soviet attitudes held that the prospective costs of nuclear war could be driven down to an acceptable level. Typically these perceptions were rooted in confidence about current or

[441] This paragraph is derived from Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Gen.-Col. (Ret.) Danilevich, Document 2 (Volume II), pp. 28-29, 40-41, 47-48, 58-59, 68-69; Battilega (2004), pp. 155, 162.
[442] This decision affected both internal military planning mechanisms as well as declaratory policy.
[443] Garthoff (1988), pp. 137, 145-147; Meyer (1988), pp. 133-135.

future Soviet capabilities. Stalin-era optimism came down to Soviet conventional advantages and the sheer size of Soviet territory. Under Khrushchev such attitudes were premised on the advantages that would attend reaching strategic nuclear parity with the United States. During Brezhnev's time in power, the promise of superiority made the prospect of nuclear war more palatable. Rather than accept the rigidity of the U.S.-Soviet balance, Soviet nuclear policy under these leaders focused on reducing Soviet vulnerability in an effort to escape the superpower strategic dilemma.

The process by which mutual vulnerability came to be more widely accepted as robust was plodding and uneven until the turning point of the early 1980s. Between the mid-1950s and that point, there were always factions within the party, military and bureaucracy that were sympathetic to this notion, but these groups, known as moderates, lacked an authoritative presence in the Soviet government. Their support for a nuclear strategy based purely on assured retaliation was usually outweighed by more traditional and conservative elements within the Politburo and defense establishment. When their views managed to manifest at top levels of decision-making, they were quickly dampened. Malenkov was probably the first high-level Soviet official to espouse beliefs along mutual vulnerability lines, and the divergence of his position from that of the conservatives resulted in a swift dismissal. A similar turn of events occurred under Khrushchev, who was also ousted after his policies fell short of the "doctrinal desideratum of Soviet superiority."[444]

Moderates continued to disapprove of the bloated, vulnerable missile force amassed by the Soviet Union, but their beliefs gained ground slowly, starting in the late 1960s with the

[444] May et al (1981), p. 341. Admittedly, there were many reasons why Khrushchev was forced out of power, including but not limited to his handling of nuclear weapons' issues. For a detailed account of his decline, see William Taubman (2003), *Khrushchev: The Man and His Era* (New York: W.W. Norton & Company, Inc.), pp. 578-619.

adoption of other strike options besides preemption. A few years later the analysts who had been involved in the strategic assessment process also appeared to acknowledge the permanence of the U.S.-Soviet balance, as their work had demonstrated the futility of seeking superiority in ever-larger numbers. Beliefs in the inescapability of mutual vulnerability became more widespread in the early 1980s, when strategic assessments managed to convince the political and military leadership that survival was not a realistic expectation. These views aligned well with the emphasis by Gorbachev's "new thinking" on the prevention of conflict as the central objective of Soviet military doctrine and thus became part of the set of concepts driving the Soviet defense agenda in the late 1980s.

Looking back, the delayed reaction of Soviet policy actors to the inescapability of mutual vulnerability can be largely attributed to two factors. First, Soviet nuclear exchange models were not part of the strategic calculus until the late 1960s, after which they were doctored to portray nuclear war as tolerable and winnable. Basic information about the physical destructiveness of nuclear weapons was restricted until the mid-1950s, and for another ten years comparisons of U.S. and Soviet capabilities did not factor in the effects of large-scale nuclear attacks. By the time MOD and MOM research institutes applied mathematical modeling techniques to nuclear war, the results were so shocking to the political leadership that subsequent assessments were censored or manipulated in order to soften the potential consequences of nuclear war. As a result, for the bulk of the Cold War Soviet actors operated off of a picture of the strategic balance that did not appreciate how uncontrollable the mess of nuclear war had grown.

Second, those in charge of deciding what would constitute unacceptable damage in a nuclear war were typically driven primarily by Soviet ideology and domestic politics, both of which tended to demand unquestioned loyalty to the overall objective of Soviet strategic

superiority. Although top officials understood that nuclear war would devastate the Soviet state, adherence to this reality was more of a political challenge than upholding Marxist-Leninist claims that socialism was certain to triumph over capitalism. In addition to hurting Soviet morale, a more thoughtful consideration for the consequences of nuclear war – and a lower threshold for its costs – would have called the utility of the arsenal the Soviet Union was building into question. This expansion of Soviet nuclear forces had served the interests of powerful Soviet actors like the defense industry and the military. To accept the permanence of mutual vulnerability would thus have required challenging a system that had been very productive.[445]

[445] Burr and Savranskaya (2009), eds., EBB No. 285, Interview with Dr. Tsygichko, Document 2 (Volume II), p. 138.

Chapter 7: Contemporary perceptions of U.S.-China mutual vulnerability[446]

The above tracing of the technical basis for the U.S.-Soviet relationship – that is, a static comparison of their strategic capabilities over time as well as the dynamic analysis of strategic assessments – demonstrates that early in the Cold War, the balance between U.S. and Soviet nuclear forces was asymmetric. Through the early 1950s the Soviet Union was unquestionably vulnerable to U.S. nuclear attack, while the United States was much less so on account of the lagged development of the Soviet nuclear striking capabilities. The risk of a Soviet nuclear strike causing extraordinary damage began to increase during the 1950s, when Soviet bombers could confidently reach the United States on two-way missions. At the same time, the large quantitative disparity between U.S. and Soviet forces kept open the possibility that the United States might be able to destroy Soviet retaliatory assets.

In the early-to-mid 1960s the material implications of the U.S.-Soviet nuclear balance made an important shift. At this point, the size and reach of Soviet nuclear forces – comprising over 5,000 nuclear and thermonuclear weapons and close to 500 ICBMs and strategic bombers – had greatly complicated U.S. chances of a successful disarming or near-disarming attack. In other words, Soviet strategic strength now presented the United States with a reciprocal challenge. For the rest of the Cold War, despite both superpowers' attempts to liberate themselves from the strategic dilemma, nuclear war models continued to find that regardless of the attack conditions or force characteristics, U.S. and Soviet capabilities were inadequate to prevent catastrophic levels of damage to home territory. In other words, a purely material

[446] Findings from this chapter were published in Caroline R. Milne (2015), "Bring Up the Bombs: Nuclear weapons should be in the U.S.-China summit agenda," *U.S. News & World Report*, September 23. At an earlier stage of analysis, this research was presented at two scholarly conferences in October 2014: the 14th PIIC Beijing Seminar on International Security in Hangzhou, China; and the Stanton Nuclear Security Fellows Seminar in Washington, D.C.

analysis of the superpower nuclear balance over the course of the Cold War suggests that U.S.-Soviet mutual vulnerability emerged in the early 1950s after the Soviet acquisition of deliverable nuclear weapons, but was of questionable longevity for the subsequent decade while U.S. intercontinental striking power grossly outweighed that of the Soviet Union; from the mid-1960s onwards, the condition seemed to deepen.

Today the balance between U.S. and Chinese nuclear forces is in transition. Historically the U.S.-China nuclear relationship was more or less defined by the U.S. possession of "one-sided dominance…in terms of its ability to preemptively eliminate China's strategic force."[447] Largely due to the modernization of Chinese capabilities, the relationship is evolving into one in which U.S. decision-makers are no longer able to guarantee a successful disarming attack against Chinese nuclear forces and the full protection of U.S. (and allied) territory from Chinese retaliation. As such, mutual vulnerability between the United States and China is in the process of emerging, if it has not done so already.[448] This chapter asks whether U.S. and Chinese policy actors believe this condition exists and if so, whether they think it will endure. While the idea of U.S.-China mutual vulnerability is not new, it remains an open question whether each side

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[447] Brad Roberts (2001), *China-U.S. Nuclear Relations: What Relationship Best Serves U.S. Interests?* Institute for Defense Analyses, Paper P-3640, p. 37. Declassified historical records suggest confidence in the U.S. ability to disarm China was high among members of the National Security Council (NSC) in the early 1970s, with Secretary of State Henry Kissinger explicitly highlighting U.S. counterforce capabilities against China during a meeting of the NSC in 1971, and a report by the NSC in 1972 reiterating U.S. possession of a "disarming strike capability against known Chinese nuclear threats." See Hans M. Kristensen, Robert S. Norris, and Matthew G. McKinzie (2006), *Chinese Nuclear Forces and U.S. Nuclear War Planning* (Washington, DC: The Federation of American Scientists and the Natural Resources Defense Council), pp. 129-132.

[448] To review a central concept provided in the introductory chapter, two states enter into a mutually vulnerable situation when an exchange between their nuclear capabilities would cause extraordinary damage to both sides. Typically this occurs when neither state can guarantee a successful disarming attack against the nuclear forces of the other under likely conflict conditions.

acknowledges it and how they assess the likelihood that the nature of the balance will persist. In other words, we lack a clear understanding of the extent to which the United States and China believe that any conceivable nuclear exchange would cause "unacceptable damage" to both participants. There are at least two reasons why this is the case. First, the technical basis underlying the relationship is still changing. Second, policy language from both sides related to China's retaliatory capabilities is ambiguous.

A major factor in judgments about a mutually vulnerable situation concerns the materiel underpinnings. In the case of the United States and China, what do the size and composition of both arsenals suggest about the level of damage that could ensue in the event of a war involving nuclear weapons? With U.S. nuclear forces holding a substantial numerical margin over the Chinese arsenal, it is typically thought that the United States has more than enough nuclear capability to inflict considerable costs on China, even if all Chinese nuclear weapons were launched at the United States first. Consequently, assessing the technical premise of U.S.-China mutual vulnerability boils down to the reverse query of how many Chinese weapons could likely survive a disarming first strike by the United States.[449] On this matter, exchange models in the public domain do not yet reflect changes in the U.S.-China nuclear balance over the past two decades that have reduced confidence in U.S. first-strike capabilities.

The most important work in recent years on the material basis of the U.S.-China nuclear relationship concerned "nuclear primacy."[450] While this research went far in highlighting the

[449] A "first strike" is defined a an attack executed by nuclear weapons and aimed at the total destruction of an adversary's nuclear forces. This type of attack is distinct from a strike aimed at decapitation or an attack utilizing both nuclear and conventional weapons.

[450] An examination of U.S. counterforce capabilities against China was a lesser-included case of Lieber and Press (2006). In their subsequent work, the U.S. ability to eliminate Chinese nuclear forces took on a more central role; see Keir Lieber and Daryl Press (2007), "U.S. Nuclear Primacy and the Future of the Chinese Deterrent," *China Security*, Winter, pp. 66-89; Keir A.

revolutionary potential of post-Cold War developments in U.S. nuclear forces relative to those deployed by Russia and China, critics took issue with the analysis' assumption that the United States could execute an all-out nuclear attack on either state with the advantage of complete strategic surprise.[451] The degree of success that the nuclear primacy thesis attributed to U.S. "bolt from the blue" attacks was undercut by the argument that the most likely of crisis conditions would motivate an advanced nuclear weapons state like Russia or China to deploy their nuclear capabilities in ways to make those forces more survivable. Such measures would complicate the intelligence, surveillance, and reconnaissance (ISR) challenges the United States would need to overcome in order to disarm either state.[452] The current study provides a more strenuous test of U.S. first-strike capabilities through the employment of models of "generated" scenarios, in which U.S. and Chinese nuclear forces are deployed at higher alert levels than they are during peacetime.

The open literature's latest simulations of U.S. first-strike capabilities vis-à-vis China also do not account for the full Chinese inventory of both silo-based and road-mobile missiles; they tend to focus on one platform category or the other.[453] The DF-5 ICBMs remain a salient

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Lieber and Daryl G. Press (2009), "The Nukes We Need: Preserving the American Deterrent," *Foreign Affairs*, Volume 88, Number 6, pp. 39-51 and technical appendix.

[451] Bruce G. Blair and Chen Yali (2006), "The Fallacy of Nuclear Primacy," *China Security*, Winter, pp. 51-77; Li Bin (2006), "Paper Tiger with Whitened Teeth," *China Security*, Winter, pp. 78-89; Jeffrey S. Lantis, Tom Sauer, James J. Wirtz, Keir A. Lieber and Daryl G. Press (2006/2007), "The Short Shadow of U.S. Primacy?" *International Security*, Vol. 31, No. 3, pp. 174-193; Peter C. W. Flory, Keith Payne, Pavel Podvig, Alexei Arbatov, Keir A. Lieber and Daryl G. Press (2006), "Nuclear Exchange: Does Washington Really Have (or Want) Nuclear Primacy?" *Foreign Affairs*, Vol. 85, No. 5, pp. 149-157.

[452] For an overview of some of these challenges, see Alan J. Vick, Richard M. Moore, Bruce R. Pirnie, and John Stillon (2001), *Aerospace Operations Against Elusive Ground Targets*, The RAND Corporation, MR-1398-AF, pp. 64-66.

[453] Recent model-based investigations in the public domain of U.S. first-strike capabilities against Chinese silo-based missiles include Kristensen et al (2006), pp. 175-186, and Lieber and Press (2009). For an analysis of the ability of U.S. radar capability to locate and follow Chinese

concern for any U.S. military planner, with the Chinese reportedly deploying silos in tunnels under mountains, using decoys, and equipping some platforms with MIRVs.[454] Yet these assets comprise a decreasing fraction of China's long-range capabilities as more road-mobile missiles are deployed. Relative to their silo-based counterparts, road-mobile platforms like the DF-31, DF-31A, and DF-31AG are believed to stand a greater chance of surviving a first strike because of the challenges involved in continuously tracking large numbers of them at the same time.[455,456] But a model focused solely on the elimination of China's mobile missiles is also insufficient, since the attacking force must include enough warheads to ensure China's stationary assets cannot be utilized to muster a retaliatory strike. To evaluate U.S.-China mutual vulnerability, this analysis extends the existing literature by marrying previous modeling approaches to counterforce strikes against stationary and dispersed, relocatable forces.[457]

The second reason why the question of U.S.-China mutual vulnerability has not garnered much attention relates to policy ambiguity concerning China's possession of a secure second-

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mobile missiles, see Li Bin (2007), "Tracking Chinese Strategic Mobile Missiles," *Science and Global Security*, Volume 15, Number 1.

[454] Office of the Secretary of Defense (OSD, 2017), *Military and Security Developments Involving the People's Republic of China 2017,* A Report to Congress Pursuant to the National Defense Authorization Act for Fiscal Year 2000, p. 31; Andrew S. Erickson (2015), "Showtime: China Reveals Two 'Carrier-Killer' Missiles," *The National Interest*, September 3; Jane's Strategic Weapons Systems (Jane's, 2014a), "DF-5," Offensive Weapons, China, August 12; Hui Zhang (2012b), "China's Nuclear Weapons Modernization: Intentions, Drivers, and Trends," July 15, Belfer Center for Science and International Affairs, p. 5.

[455] For an overview of the difficulties involved in tracking mobile targets, see James Acton (2013), *Silver Bullet? Asking the Right Questions about Conventional Prompt Global Strike* (Washington, DC: Carnegie Endowment for International Peace), pp. 82-84.

[456] On the recently debuted DF-31AG, see Eric Gomez (2017), "Meet the DF-31AG and the DF-26: The Big Ballistic Missiles at China's Military Anniversary Parade," *The Diplomat*, August 8.

[457] Specifically, the standard set of equations used to evaluate to stationary targets, such those underlying Lieber and Press (2009), are combined with the analysis of Chinese mobile missiles in Li Bin (2007).

strike capability.[458] The official U.S. position leaves much room for interpretation. With the stipulation that "maintaining strategic stability in the U.S.-China relationship is as important to the Administration as maintaining strategic stability with other major powers," the 2010 Ballistic Missile Defense Review only insinuates that China's retaliatory capability is robust.[459] Since then the United States has not appeared to decide whether China's nuclear forces should be addressed with tools of deterrence or defense.[460] Most U.S. expert analyses tend to the claim that China is close to acquiring secure second-strike strike forces *vis-à-vis* the United States, but clear confirmation that the capability has materialized does not yet seem warranted.[461]

The Chinese government's position has long held that its arsenal should be deployed in a way that ensures enough nuclear weapons would survive a disarming first strike to impose unacceptable damage on the aggressor in retaliation.[462,463] But whether Chinese political

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[458] Glaser (2015), p. 53. A secure second-strike nuclear capability is commonly thought of as an array of nuclear forces that – through platform mix, basing modes and alert posture – can withstand an attack intended to fully disarm the defender and subsequently retaliate against the aggressor.

[459] United States Department of Defense (DOD, 2010), *Ballistic Missile Defense Review Report* (Washington, DC), April, p. 34; see also DOD (2013), *Report on Nuclear Employment Strategy of the United States, Specified in Section 491 of 10 U.S.C.*, unclassified summary (Washington, DC), June 12, p. 3.

[460] Jeffrey Lewis (2014), *Paper Tigers: China's Nuclear Posture,* Adelphi Series, Volume 54, Number 446, p. 133. It remains to be seen how the current Trump Administration will handle the question of China in this year's nuclear posture review; see Gregory Hellman (2017), "Pentagon launches nuclear posture review," *Politico,* April 18.

[461] For example, Andrew S. Erickson and Michael S. Chase (2014), "China Goes Ballistic," *The National Interest*, May/June, p. 60. Nicolas Giacometti (2014), "China's Nuclear Modernization and the End of Nuclear Opacity," *The Diplomat*, April 10.

[462] M. Taylor Fravel and Evan S. Medeiros (2010), "China's Search for Assured Retaliation," *International Security*, Volume 35, Issue 2, p. 51; Cunningham and Fravel (2015), p. 13; Li Bin (1999), "China's Nuclear Disarmament Policy," in *The Nuclear Turning Point: A Blueprint for Deep Cuts and De-Alerting of Nuclear Weapons*, ed. Harold A. Feiveson (Washington D.C.: Brookings Institution Press), pp. 326-327. Wu Riqiang unpacks the role of first-strike uncertainty in this calculation; see Wu Riqiang (2013), "Certainty of Uncertainty: Nuclear Strategy with Chinese Characteristics," *Journal of Strategic Studies*, Volume 36, Number 4, pp. 579-614.

decision-makers believe their nuclear forces can fulfill this mission is uncertain. One stance is that leaders have been confident in the first-strike uncertainty created by their nuclear forces since the mid-1980s, when the first Chinese ICBMs were deployed and the Second Artillery Corps of the People's Liberation Army achieved an independent launch capability.[464] Another perspective ties changing Chinese perceptions about the survivability of the state's nuclear forces to the development of road-mobile, solid-fueled missiles and improvements in command and control; accordingly, internal confidence about China's retaliatory forces would not have emerged until relatively recently.[465]

U.S. and Chinese policy language about China's second-strike capability is equivocating in large part for national security reasons; maintaining a healthy degree of uncertainty can enhance the credibility of nuclear deterrence on both sides. Still, unpacking the notion of unacceptable damage and the conditions under which this is an outcome seen as one that Chinese nuclear forces can guarantee is important for understanding the role of mutual vulnerability in U.S.-China relations. The current analysis is thus partially based on in-depth interviews with U.S. and Chinese defense and foreign policy experts and former officials.[466] These discussions were aimed at shedding light on the extent to which mutual vulnerability is seen as a permanent fact of life for the United States and China, and how both sides were learning to manage it.

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[463] In 2013 the Academy of Military Sciences of the People's Liberation Army of China published the most recent edition of *The Science of Military Strategy*. This document, typically taken as an authoritative statement of Chinese military thinking, leaves the desired number of retaliating warheads open to question. See Gregory Kulacki (2015), *The Chinese Military Updates China's Nuclear Strategy*, Union of Concerned Scientists, March, pp. 2-3.
[464] Wu Riqiang (2013), pp. 599-608.
[465] Christensen (2012), p. 452, 454-460.
[466] Twenty-four interviews were conducted during 2015 about the possible acquisition by China of a secure second-strike capability against the United States and the emergence and implications of mutual vulnerability in U.S.-China relations.

The remainder of this article is divided into four sections. The next two parts use exchange-modeling analysis (i.e., the author's own strategic assessment) to establish that the technical basis for U.S.-China mutual vulnerability has likely emerged; under most 2018 contingencies, China would be able to inflict unacceptable damage on the U.S. territory in response. With that said, the size differential between U.S. and Chinese nuclear forces implies that under some conditions, nuclear war could be viewed as highly costly but potentially favorable for the United States, at least relative to China. In other words, the numbers imply that U.S.-China mutual vulnerability may a current strategic fact, but not necessarily an enduring one. The perceptions unpacked in the fourth section find some alignment with these calculations. Chinese experts worried that the United States might try to build its way out of mutual vulnerability, while a fair number of U.S. participants believed that U.S. acceptance of the condition might give Chinese leaders reason to think they could fight and win a limited war. The chapter closes by teeing up the policy choices that the evolution of forces presents to both sides, an issue considered more intently in the dissertation's conclusion.

Testing the technical basis of U.S.-China mutual vulnerability

To assess the extent to which the near-term array of U.S. and Chinese nuclear forces implies a mutually vulnerable relationship, this study used nuclear exchange models to approximate the contours of a U.S. strike on Chinese nuclear forces and subsequent Chinese response.[467] The

[467] Although the simulations are relatively simple, the many uncertainties inherent in an exercise of this kind imply that increasing the complexity of the calculations would not necessarily improve the precision of the results (Congressional Budget Office (1991), *The START Treaty And Beyond*, p. 143). It is safe to posit that the models are robust and realistic enough to encapsulate the key facets of a nuclear strike. Furthermore, these models are not meant to represent the author's take on exactly what the actual military balance looks like, but rather to inform prudent military planning efforts. The effort relies on the standard set of equations and

attacks were envisioned to take place amidst a deepening politico-military crisis and escalating conventional conflict between the two states in 2018, during which U.S. national command authorities decide to launch a nuclear strike.[468] Hypothetical attacks were aimed at the total elimination of Chinese nuclear forces capable of reaching U.S. territory, U.S. force deployments abroad, and the territory of U.S. allies; the number of remaining Chinese weapons was then calculated to get a sense of what a retaliatory attack against U.S. assets could look like.

The following subsections walk through the key assumptions and parameters governing the performance of U.S. and Chinese nuclear forces in the models. As mentioned above, one critical premise was that the United States did not have the advantage of strategic surprise. Since the strikes took place during an ongoing crisis, China was expected to have taken steps to deploy its nuclear forces for survivability reasons, including mating missiles with their respective warheads; dispersing the entire mobile missile inventory on transporter erector launchers (TELs); and flushing out strategic submarines (SSBNs). [469,470] These measures would confront U.S.

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assumptions used in force balance assessments. For a paradigmatic example from the Cold War, see Lynn Etheridge Davis and Warner R. Schilling (1973), "All You Ever Wanted to Know About MIRV and ICBM Calculations But Were Not Cleared to Ask," *Journal of Conflict Resolution*, Vol. 17, No. 2, pp. 207-242. These techniques are still employed to perform damage expectancy calculations, such as in Lieber and Press (2006) and Lieber and Press (2009). The current study marries these equations, which are primarily used to determine the number of warheads required to destroy stationary targets, with Li Bin's work on tracking and targeting mobile missiles in Li Bin (2007).

[468] For more on the crisis conditions capable of producing such events, see Robert Farley (2017), "A War Between the U.S. and China Would be World War III (And Might Be Hard to Shut Off)," *The National Interest*, February 2; Bruce G. Blair (2005), "General Zhu and Chinese Nuclear Preemption," *China Security*, Autumn, p. 19; Keir Lieber and Daryl Press (2007), p. 74.

[469] The process of mating warheads with their delivery systems might take a few weeks since all warheads are believed to be housed at one location; Mark Stokes (2010), *China's Nuclear Warhead Storage and Handling System*, Washington D.C.: Project 2049 Institute.

[470] For missile brigades to disperse, China is projected to have an operational early warning system capable of detecting incoming missile attacks. China already possesses some early warning radar capability and is currently working on its first satellite; see "China Seen Readying Space-Based Warning Sensor," *Global Security Newswire*, July 25, 2013.

military planners with a more challenging set of targeting constraints than those presented by a "bolt from the blue" scenario.[471]

Another significant assumption concerned the quality of U.S. intelligence about Chinese road-mobile missile locations.[472] To reflect current technological realities and prospects, U.S. ISR resources were predicted to have an imperfect ability to track Chinese relocatable assets; as a consequence, U.S. strategists would have to structure the first-strike operation in the context of periodic detection of Chinese mobile missile locations. For the best chances of destroying these forces, the models presume the United States would use nuclear weapons to barrage the roads where Chinese TELs or TEL convoys would be hiding or in transit.[473,474] If the attack was initiated as soon as intelligence information about Chinese missile locations was updated, these bombardment regions would be roughly defined by a circle with a radius equivalent to the distance a Chinese TEL moving at average speed could travel during the minimum flight time required by U.S. attacking forces.[475] For the exchanges modeled here, the diameters of the

[471]Still, a U.S. preemptive "bolt from the blue" attack is probably a scenario that Chinese strategists use for planning purposes to assess the adequacy of their forces.
[472] The United States was assumed to have perfect intelligence about stationary targets.
[473] The model assumes equal numbers of TELs and missiles are deployed. DF-21 missiles are believed to travel in 3-TEL convoys (Jane's (2014b), "DF-21," Offensive Weapons, China, June 24). All other missiles use single-TEL convoys and are thought to be dispersed in such a way that the exposure of one missile would not necessitate the exposure of other missiles.
[474] As Li Bin notes, "The movement of a TEL creates uncertainty in its location during the flight of incoming missiles and the attacker would need to launch a volley of several warheads to cover the area of uncertainty." Li Bin (2007), p. 7. For more on this approach to attacking road-mobile missiles, see Office of Technology Assessment (1981), *MX Missile Basing* (Washington, DC: United States Government Printing Office), pp. 258-261.
[475] In prosecuting mobile targets, the United States was assumed to bombard roads; consequently, the targeted fraction of this circle depended on average Chinese road density in the regions where China is believed to keep position its road-mobile missile networks. Using Li Bin (2007) as precedent, TELs were assumed to travel on roads of average density (0.17 km/km^2) (p. 9). Furthermore, ICBM TELs were assumed to travel at an average speed of 45 km per hour, while MRBM TELs were assumed to travel at an average speed of 60 km per hour; Jane's

dispersal areas associated with each Chinese relocatable asset were about 13 miles wide to 17 miles wide (depending on TEL speed) and required the expenditure of about 10 attacking weapons to 30 attacking weapons (depending on warhead yield).

Limiting U.S. tracking capabilities may bias the findings in favor of Chinese nuclear forces. In recent years the United States is reported to have made stunning advances in ISR technologies, greatly reducing the difficulties that moving targets pose for counterforce operations.[476] Despite these developments, the current analysis assumes that for the foreseeable future, the United States is unlikely to deploy intelligence resources that can provide continuous location data for Chinese mobile assets. While a comprehensive assessment of U.S. ISR capabilities is beyond the scope of this analysis, the public literature suggests the two most promising types of U.S. programs (low-observable aircraft and satellites) face a combination of technological, bureaucratic, and financial challenges.[477,478] Furthermore, at the same time U.S.

(2014c), "DF-31," Offensive Weapons, China, October 6; Jane's (2015), "DF-41," Offensive Weapons, China, January 6; Jane's (2014b).

[476] Austin Long and Brendan Rittenhouse Green (2015), "Stalking the Secure Second Strike: Intelligence, Counterforce, and Nuclear Strategy," *Journal of Strategic Studies*, Volume 38, Issues 1-2, pp. 38-73; Green et al (2017), pp. 193-195; Keir A. Lieber and Daryl G. Press (2013), "Commentary: The New Era of Nuclear Weapons, Deterrence, and Conflict," *Strategic Studies Quarterly*, Volume 7, Number 1, pp. 3-12.

[477] Notable U.S. airborne programs include the RQ-170 Sentinel unmanned aerial system (UAS) as well as manned radar aircraft like the E-8 Joint Surveillance Targeting and Attack Radar System (JSTARS). Even with stealthy technology, it is remains to be seen how both types of assets would perform in theater against active Chinese air defenses. Replacements for both of these particular systems are in the defense procurement pipeline, but with high costs and the pace of technological development it's unclear when either capability will mature. The new version of the RQ-170 may be fielded soon, but the successor of JSTARS, which was first introduced in 1991, is slated to deploy in the "mid-2020s." See Acton (2013), p 84; Long and Green (2015), pp. 61-62; U.S. Air Force (2015), "Fact Sheet: E-8C Joint Stars," September 23; Lara Seligman (2016), "JSTARS Contract Award Slips; IOC in 'mid-2020s'," *Defense News*, February 19; "JSTARS Replacement: Competition Opened Wide," *Defense Industry Daily*, March 28, 2016; Amy Butler and Bill Sweetman (2013), "Secret New UAS Shows Stealth, Efficiency Advances," *Aviation Week & Space Technology*, December 6.

ISR capabilities are maturing, China is making its missiles harder to find through the refinement of concealment, denial, and deception techniques. As a consequence, it seems realistic to assume that a fully operational U.S. capability to simultaneously track tens of moving targets is unlikely to manifest during the timeframe in which the modeled scenarios take place.

U.S. forces. The offensive side of the models focused on three increasingly capable variants of U.S. counterforce strikes, broken out in Table 5. Attacks were carried out by SLBM warheads fielded on *Ohio*-class SSBNs as they are slated to deploy in 2018.[479] Case 1, the base case, draws on the warheads available on the four submarines typically believed to be on "hard alert" in the Pacific.[480] Cases 2 and 3 assume that the United States would intensify the SSBN deployment patterns on account of military tensions with China and place additional nuclear firepower within striking range of Chinese forces. In case 2, U.S. nuclear forces were augmented by three SSBNs that might otherwise be traveling to or from patrol boxes in the Pacific. Case 3

[478] There are few open-source assessments of U.S. space-based tracking capabilities, but the programs that receive the most public attention are space radar, reconnaissance satellites, and satellite-based signals intelligence (SIGINT). Satellite-based radar may have the most potential in theory, but plans to deploy enough assets for continuous surveillance appear dormant; even if such a system were fielded, it would have to overcome Chinese countermeasures. Space-based imagery and SIGINT options are less credible, with the former obfuscated by the presence of clouds and the latter possibly confounded by relatively simple evasive tactics like communication encryption. See Acton (2013), pp. 83-84; Li Bin (2007); Long and Green (2015), pp. 62-63.

[479] The size and structure of future U.S. nuclear forces is based on the extrapolation of trends described in Hans M. Kristensen and Robert S. Norris (2015), "US nuclear forces, 2015," *Bulletin of the Atomic Scientists*, Volume 71, Number 2, pp. 107-119 and Kingston Reif (2015), "Fact Sheet: U.S. Nuclear Modernization Programs," Arms Control Association, December. The current status of U.S. forces under New START can be found in biannual data exchange records, the most recent of which is U.S. Department of State (2017), "Fact Sheet: New START Treaty Aggregate Numbers of Strategic Offensive Arms," Bureau of Arms Control, Verification and Compliance, April 1. The eventual structure of U.S. nuclear forces in 2018 is outlined in U.S. Department of Defense (2014), "Fact Sheet on U.S. Nuclear Force Structure under the New START Treaty."

[480] Hans M. Kristensen and Robert S. Norris (2014), "US nuclear forces, 2014," *Bulletin of the Atomic Scientists*, Volume 70, Number 1, pp. 90-91.

also featured seven boats, but the SLBMs on each SSBN carried additional warheads so that all missiles were almost at full capacity.[481] These boats assume some risk of detection because they would have to travel more quickly than they otherwise would. However, such risk would likely be warranted by the ongoing crisis, and Chinese antisubmarine capabilities are unlikely to mature significantly by 2018.[482]

By concentrating on attacks composed solely of SLBM warheads, the analysis excludes other capabilities that the United States might leverage for a counterforce strike against China. The inclination to augment the size of U.S. attacking forces must be balanced with the notion that during an actual crisis, a fraction of U.S. capabilities would likely be withheld from an initial strike to address the possibility of follow-on attacks, potential demands of escalation control, and future contingencies involving other adversaries.[483] Some assets were also kept out of the attacking force due to operational risks. For example, U.S. ICBMs were considered unusable

[481] Case 3 assumes U.S. reserves are large enough to provide the additional warheads. Tapping the upload potential of the reserve stockpile to this degree would violate New START limitations on the number of warheads the United States is permitted to load onto strategic systems; therefore, the decision to generate this magnitude of firepower may be noticed by Russia if treaty-mandated on-site inspections, which look at the number of warheads deployed on SLBMs, occur during the upload period. The United States could thus incur some political costs for noncompliance, possibly leading to Russian or U.S. withdrawal from the treaty. At the same time, one estimate suggests the firepower called for in case 3 could be acquired in a matter of days, which may comprise a small enough window to preserve the privacy of the operation; see Global Zero Commission on Nuclear Risk Reduction (2015), *De-Alerting and Stabilizing the World's Nuclear Force Postures*, (Washington, DC: Global Zero), p. 58.

[482] OSD (2017), p. 50; Hong Kong (2015), "China's island airstrips to heighten South China Sea underwater rivalry," *Reuters*, September 17.

[483] The drawbacks to utilizing the entire U.S. arsenal in a counterforce attack are highlighted by James Wirtz in Lantis et al (2006/2007), p. 184. It's conceivable that strategic planners might not want to devote all of the Pacific SSBN warheads to Chinese targets on account of future contingencies, such as the requirement for 2-on-1 targeting of Russian forces should that need arise.

Table 5. Parameters of U.S. forces[484]

Attacking U.S. forces, ~2018	SSBN total	SLBM total	Warheads per SLBM	W88 warhead total	W76-1 warhead total	Warhead total
Case 1: typical SSBN hard alert presence in the Pacific	4	80	4-5	145	218	363
Case 2: surged SSBN capacity in the Pacific	7	140	4-5	254	382	636
Case 3: surged SSBN capacity in the Pacific with warheads uploaded	7	140	7-8	422	634	1056

[484] The W88 and W76-1 warhead yields are estimated at 455 and 100 kilotons, respectively; see Hans M. Kristensen and Robert S. Norris (2017), "US nuclear forces, 2017," *Bulletin of the Atomic Scientists*, Volume 73, Number 1, p. 49. Warheads are uniformly distributed across available SLBMs. In cases 1 and 2, loadings are derived by dividing the total number of SLBM warheads by the total number of SLBMs expected under the New START Treaty. The model adopts typically reported values for accuracy of the Trident D-5 SLBM (130 m) and system reliability (80 percent). Sources for these parameters include John R. Harvey and Stefan Michalowski (1994), "Nuclear Weapons Safety: The Case of Trident," *Science & Global Security*, Volume 4, p. 334; McKinzie et al (2001), p. 19, 44; Bruce Blair, Victor Esin, Matthew McKinzie, Valery Yarynich, and Pavel Zolotarev (2011), "One Hundred Nuclear Wars: Stable Deterrence between the United States and Russia at Reduced Nuclear Force Levels Off Alert in the Presence of Limited Missile Defenses," *Science & Global Security*, Volume 19, Number 3, p. 174.

since they must fly over Russian territory to reach Chinese targets, potentially activating Russian early warning radar.[485] U.S. heavy bombers were also excluded, given the chances of possible interception by Chinese air defenses and the likelihood that such aircraft would already be deployed in support of other missions related to the ongoing crisis.

Finally, U.S. conventional forces were withheld to preserve an analytical focus on the nuclear balance between the two states. It's hard to totally discount the possibility that the United States might draw on its conventional assets in a strike against Chinese nuclear forces, particularly in light of Chinese concerns about such a scenario.[487] That being said, an exclusively nuclear offensive likely offers the best option in the context of imperfect U.S. tracking capabilities. If the United States cannot locate and track mobile missiles definitively, it needs the lethal range provided by nuclear weapons to prosecute those targets. A breakthrough in the U.S. intelligence situation could greatly facilitate a conventional strike, but this potentiality is not robust enough to warrant folding conventional weapons into models of U.S. counterforce strikes.

Chinese forces. By 2018, the models assume Chinese nuclear forces have evolved in a manner consistent with the gradual pace of modernization efforts over the past twenty years.[488] China will have fielded roughly one and two additional brigades of the DF-31A ICBM and DF-21/DF-21A medium-range ballistic missile (MRBM), respectively, and a few more DF-31

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[485] Hans M. Kristensen, Robert S. Norris, and Matthew G. McKinzie et al (2006), *Chinese Nuclear Forces and U.S. Nuclear War Planning* (Washington, DC: The Federation of American Scientists and the Natural Resources Defense Council), p. 132, 175. Concerns about ICBM overflight issues in the event of a strike on China date back to at least the early 1970s; see National Security Council, Defense Program Review Committee (1972), "U.S. Strategic Objectives and Force Posture Executive Summary," January 3, in Burr (2005), ed., EBB No. 173, Document 4, pp. 99-108.

[487] Cunningham and Fravel (2015), pp. 19-23.

[488] *China's Offensive Missile Forces: Hearing before the U.S.-China Economic and Security Review Commission* (2015), 114th Congress, pp. 59-70 (testimony of Christopher Twomey); Hans M. Kristensen and Robert S. Norris (2016), "Chinese nuclear forces, 2016," *Bulletin of the Atomic Scientists*, Volume 72, Number 4, pp. 205-211.

missiles.[489] China will also have introduced the first copies of the DF-41 ICBM, each with a three-warhead payload.[490] Out of the older systems, China is expected to retain both the silo-based and MIRV-capable DF-5 (i.e., the DF-5A and DF-5b, respectively), but retire both the DF-4 and DF-3A IRBMs.[491] China's sea-based nuclear forces will also be continuing operations, with four Type 094 *Jin*-class submarines conducting patrols.[492]

The modeling effort pitted the three U.S. strike cases described above against this array of Chinese nuclear forces, along with supporting bases and infrastructure. Tables 6 and 7 list the basic mobile and stationary target sets subjected to attack. Recall that all Chinese SSBNs and road-mobile missiles were assumed to be in transit, to reflect a decision by Chinese command authorities to augment the survivability of the nuclear arsenal on account of the ongoing military conflict with the United States. In addition to this case, two variants of the list were analyzed (for a total of nine force-on-force calculations). To explore the impact of decoy launchers on the ability of the United States to execute a successful disarming strike, the base case was compared

[489] The DF-21 and DF-31A missiles have comprised the bulk of new MRBM and ICBM deployments, respectively, thus far.

[490] Estimates for the number of warheads to be deployed on the DF-41 vary from three weapons to ten weapons. While the most recent annual DOD report notes that the platform is MIRV-capable, it does not specify the warhead capacity (OSD (2017), p. 31). At least one expert report puts the DF-41's likely potential at three warheads (Hans M. Kristensen (2015), "Pentagon Report: China Deploys MIRV Missile," Federation of American Scientists, Strategic Security Blog, May 11). More conservative estimates place the maximum payload at ten warheads (Jane's (2015); Franz-Stefan Gady (2015), "China Tests New Missile Capable of Hitting Entire United States," *The Diplomat*, August 19). In its 2014 annual report, the U.S.-China Economic and Security Review Commission also specified the DF-41 was capable of carrying ten warheads (*2014 Report to Congress*, p. 321), but the 2015 and 2016 reports refrained from specific details about the DF-41's potential.

[491] Decommissioning the DF-4 and DF-3A would be a development consistent with expectations of experts on Chinese nuclear policy; see Erickson and Chase (2014), p. 61. On the DF-5, see OSD (2017), p. 31; Kristensen (2015), "Pentagon Report"; Jeffrey Lewis (2015), "Great, Now China's Got Multiple Nuclear Warhead Missiles?" *Foreign Policy,* May 26.

[492] *Jin*-class SSBN patrols are believed to have started in 2016. The latest Pentagon report on Chinese military power describes the four boats as "operational." OSD (2017), p. 24.

Table 6. Parameters of mobile Chinese assets (base case)[496]

Platform	**~2018 predictions**	**Hardness (psi)**
DF-31A	36 missiles/TELs (3 brigades)	10
DF-31	12 missiles/TELs (1 brigade)	
DF-41	5 missiles/TELs (1 brigade)	
DF-21/DF-21A	33 convoys of 3 missiles/TELs, totaling 99 missiles/TELs	

[496] Deployment numbers were derived by extrapolating trends reported by Kristensen and Norris (2016), Kristensen et al (2006), and Jane's assessments of the DF-21, DF-31, and DF-41. SRBMs and cruise missiles are excluded due the paucity of public detail. 10 psi is a typical assumption for the overpressure that can be withstood by mobile missiles that have not been hardened against nuclear effects; see CBO (1991), p. 150.

Table 7. Parameters of stationary Chinese assets (base case)[497,498]

Platform	**~2018 predictions**	**Hardness (psi)**
DF-5A, DF-5B	20 silos, 10 decoy silos	3000
Missile bases	6	2690
Mobile missile garrisons	20	530
SSBN bases and facilities	4	20

[497] Chinese stationary targets in 2018 are predicted using various estimates, including Kristensen and Norris (2016); Kristensen et al (2006), pp. 60, 175-186; Erickson and Chase (2014); Jane's (2014b); Jane's (2014c); Stokes (2010), pp. 6-8; Lewis (2014), pp. 113-117; OSD (2013), *Military and Security Developments Involving the People's Republic of China 2013,* A Report to Congress Pursuant to the National Defense Authorization Act for Fiscal Year 2000, p. 10, 31; Hans M. Kristensen (2014), "China SSBN Fleet Getting Ready – But For What?" Federation of American Scientists, Strategic Security Blog, April. Command and control facilities and the central warhead storage facility are excluded given their deeply buried locations.

[498] With respect to hardness, Kristensen et al (2006) equates the overpressure that Chinese missile silos are capable of withstanding to that of second-generation Soviet missile silos (p. 179). Since the first Soviet silos were reportedly hardened to about 1500 psi, this would require a doubling in hardness between generations; Podvig (2008), p. 131. Overpressure values for supporting missile facilities were derived from the treatment of nuclear weapons storage locations (pp. 369-374) in the 1989 *NATO Target Data Inventory (NTDI) Handbook*, produced by the Headquarters United States European Command and the Defense Intelligence Agency, and released under the Freedom of Information Act in 1998. Storage locations within China's missile bases and mobile missile garrisons were assigned the vulnerability numbers attributable to "National" or "Direct Support" and "Type VIII (Single Bay)" bunkers, respectively. China's SSBN facilities were assumed to be relatively soft, as detailed by the discussion of naval targets in McKinzie et al (2001), pp. 70-72.

with scenarios in which China fields decoy TELs equivalent to an additional 25 percent and 50 percent of the predicted TEL inventory.[499,500]

Attack specifications. The larger-yield W88 warheads were employed against ICBM silos (including decoys) and mobile ICBM TELs; W76-1 warheads were assigned to the remainder of targets.[501] A two-step process was then used to determine how many Chinese weapons could be expected to survive a disarming strike of a given magnitude. First, the "probability of kill" formula established the minimum number of U.S. warheads required to destroy all stationary Chinese targets, and, where applicable, stationary decoys, with at least 99 percent likelihood.[502] The rest of U.S. forces attacked the dispersal areas associated with the TELs and where applicable, decoy TELs.[503] As noted above, the number of U.S. warheads demanded by each mobile target depended on the minimum flight time required by a Trident

[499] In these cases, the United States cannot distinguish between actual and decoy TELs and thus targets both types of vehicles with the same number of weapons.
[500] Annual DOD reports on Chinese military power have routinely highlighted the Chinese use of or interest in decoy technology (for example, see OSD (2017), p. 60), but these assessments pertain to BMD countermeasures, such as penetration aids. There does not appear to be much of a discussion of decoy launchers in the open academic or government literature, though a RAND report does cite them as a way for China to augment the size of the tracking problem for an adversary; see Vick et al (2001), p. 61. If China believes the United States is pursuing first-strike capabilities, TEL decoys are an option the Chinese could invest in to offset that cheaply. Such a decision would be consistent with the importance of denial and deception in Chinese military strategy, an issue often raised by the annual DOD assessment; OSD (2016), *Military and Security Developments Involving the People's Republic of China 2016,* A Report to Congress Pursuant to the National Defense Authorization Act for Fiscal Year 2000, p. 74.
[501] U.S. command and control is assumed to be capable of perfectly timing the attack in cases where different platforms fire on the same targets.
[502] Detonations against stationary targets were assumed to be ground bursts, and the risk of fratricide was trivial. The formulas used for lethal range and probability of kill can be found in Davis and Schilling (1973), pp. 210-214. For lethal range, the General Electric Missile Effectiveness equations were used.
[503] The formula for lethal range against mobile targets came from CBO (1991), p. 150. Warhead quotas per mobile target were derived using the method in Li Bin (2007), p. 9.

SLBM to hit Chinese targets, which has been estimated at around 14 minutes.[504] If the attacking warhead quota was not met for a particular Chinese TEL, that missile was considered available for a Chinese response.

By the numbers, U.S.-China mutual vulnerability is a strategic reality, but not necessarily robust

The number of Chinese ICBM warheads calculated to survive the U.S. counterforce attacks analyzed here suggests that under most 2018 contingencies, China would be able to inflict unacceptable damage on the continental United States (CONUS) in response. Figure 8 illustrates the results of the nine force-on-force calculations described in the previous section. Looking at the base U.S. case in the first column, China would have at least 40 warheads to draw on for a response if the United States were to attack with the typical SSBN presence in the Pacific under peacetime conditions; an additional 15 weapons to 25 weapons would be available should China employ decoy TELs. Results from the other two cases demonstrate the difficulty, but not total infeasibility, of shielding U.S. cities from Chinese retaliation by allocating additional firepower to counterforce operations. Flushing out three more submarines to firing boxes in range of Chinese targets would not greatly reduce the size of a Chinese counterattack; at least 30 weapons might still reach U.S. soil. U.S. chances for success substantially improve in the third case, with seven fully uploaded SSBNs eliminating the Chinese force, in the absence of a significant boost

[504] Li Bin (2007), p. 8.

in decoys.[508] As such, there are at least two nuclear war scenarios, and thus probably others, that could potentially leave the United States in a superior position to China.[509]

Interview discussions about the level of damage that U.S. decision-makers would tolerate imply that even the smallest of these retaliatory strikes would qualify as unacceptable. Though any state's threshold for suffering is largely unknowable until the situation presents itself, the majority of U.S. and Chinese experts consulted as part of this project perceived the U.S. appetite for nuclear costs to be much lower than it was during the Cold War, on the order of one or a few retaliatory warheads. At the same time, given the numerical disparity in U.S. and Chinese forces, any near-term scenario would feature a much heavier blow against China than against the United States; for example, in contrast with the maximum of about 70 warheads that could reach CONUS in the exchanges modeled here, the number of weapons detonating on Chinese soil ranged from 350 to over 1,000. Thus it is likely that under these circumstances China would experience higher levels of damage than the United States would; what's more, under such a scenario costs that were once considered unacceptable may no longer be. If U.S. and Soviet perspectives during the Cold War are any precedent, these exchanges could be viewed as highly costly but potentially favorable for the United States, at least relative to China. In other words, the sizable asymmetry in capabilities point out by these models implies that the United States may still be able to redress its vulnerability to Chinese retaliation.

[508] In other words, the values in the third column of Figure 8 for the number of surviving Chinese warheads in the cases of zero decoys and 25% percent decoys are zero.
[509] Though the successful offensives would require serious effort by the United States – i.e. uploading roughly four hundred400 warheads – and could be potentially offset with a relatively easier Chinese investment in about thirty decoy launcher vehicles.

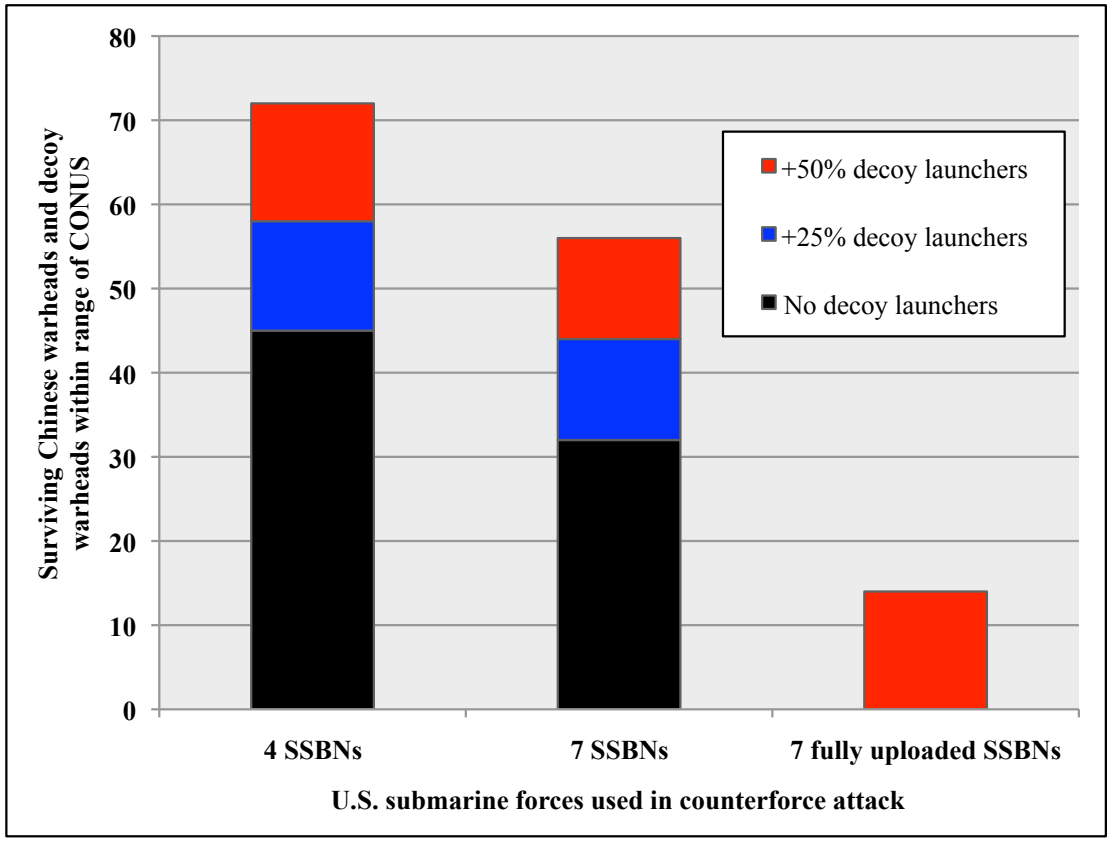

Figure 8. Chinese retaliatory ICBM forces, 2018[510]

[510] With ranges of 7,000 to 11,000 kilometers, all three of the surviving missile types – the DF-31A, DF-31, and DF-41 ICBMs – are capable of reaching some fraction of CONUS. For range data, see Kristensen and Norris (2016), pp. 206, Jane's (2014c), and Jane's (2015). Recall that these figures assume the DF-41 carries three warheads; thus the size of the retaliatory attack could be larger if the missile is deployed with more.

Though not depicted in Figure 8, incorporating China's theater-range missile capabilities into the analysis illustrates that mutual vulnerability could present greater risks for U.S. allies and forward deployed troops than it does for the U.S. homeland.[513] The entire inventory of nuclear-capable DF-21 MRBMs China could field by 2018 emerged virtually unscathed from the counterforce strike analysis.[514] MRBM forces were not impacted until the firepower associated with seven fully uploaded SSBNs was levied against Chinese forces; even then, less than ten missiles were destroyed. This conclusion is tied to the attack structure of the exchange models – China's longest-range missiles were targeted first – but it shows that the United States cannot expect its nuclear counterforce capabilities to limit damage to CONUS and its allies in the event of a nuclear war with China.

While the United States may still be technically able to deny a condition of mutual vulnerability with China, continued Chinese investment in mobile ICBM forces is likely to curtail this advantage. To explore how the potential evolution of Chinese forces might impact the robustness of the balance, the modeling effort also considered how the same U.S. strikes might fare against a doubled Chinese mobile ICBM force. The results, illustrated below in Figure 9, underscore that any future growth of China's road-mobile missile inventory is likely to further outpace the warheads the United States could be reasonably expected to deliver against alleged transit areas of TELs in the event of a crisis. In all three scenarios, an enormous number of U.S. warheads does not yield realistic prospects of eliminating China's mobile forces. First consider the smallest Chinese target set, denoted by the black line. Before the attack, China has about 100 mobile ICBMs; as the United States expends warheads, that number decreases. However, even a

[513] Theater-range missiles are included in the analysis to highlight the challenges presented by the U.S. extended deterrent guarantees to allies and U.S. forces deployed in the region.
[514] The analysis considered only the variants of the DF-21 that are allegedly capable of carrying a nuclear payload, the DF-21 and DF-21A. See Kristensen and Norris (2016), p. 206.

surge of U.S. SSBNs and more warheads on each boat cannot reduce the size of the surviving arsenal to zero; about 20 weapons survive. The probability of a successful strike worsens when decoy TELs are incorporated. In the case where China disperses decoys equivalent to 50 percent of its missile force (symbolized by the red line), the model suggests that more than 70 missiles would be available for a Chinese counterstrike. To summarize, a durable, mutually vulnerable balance is likely after China acquires something like 100 mobile ICBMs.

Subjecting the U.S.-China balance to exchange-modeling analysis suggests that the two states have more or less entered into a relationship of mutual vulnerability. At the current time the United States is unlikely to have the ability to attack Chinese nuclear forces without facing the prospect of unacceptable retaliatory damage against CONUS and its allies. That being said, the size differential between U.S. and Chinese nuclear forces implies that the United States could potentially reduce its risk under highly favorable attack conditions, while China cannot. Looking ahead, the continued acquisition of mobile ICBMs by China appears sufficient to "lock in" U.S.-China mutual vulnerability permanently. Barring a breakthrough in U.S. tracking capabilities, the targeting demands necessitated by China's increasingly large and professional road-mobile missile force would likely guarantee the deepening of U.S.-China mutual vulnerability.[515] For the foreseeable future, China's ability to hold assets of the United States and its allies at risk is likely to increase at the same time that the U.S. ability to completely eliminate Chinese nuclear forces in a first strike continues to shrink.

[515] For a deeper discussion of the interplay between U.S. advancements in strategic surveillance and Chinese advancements in mobile missile technology, see Green et al (2017).

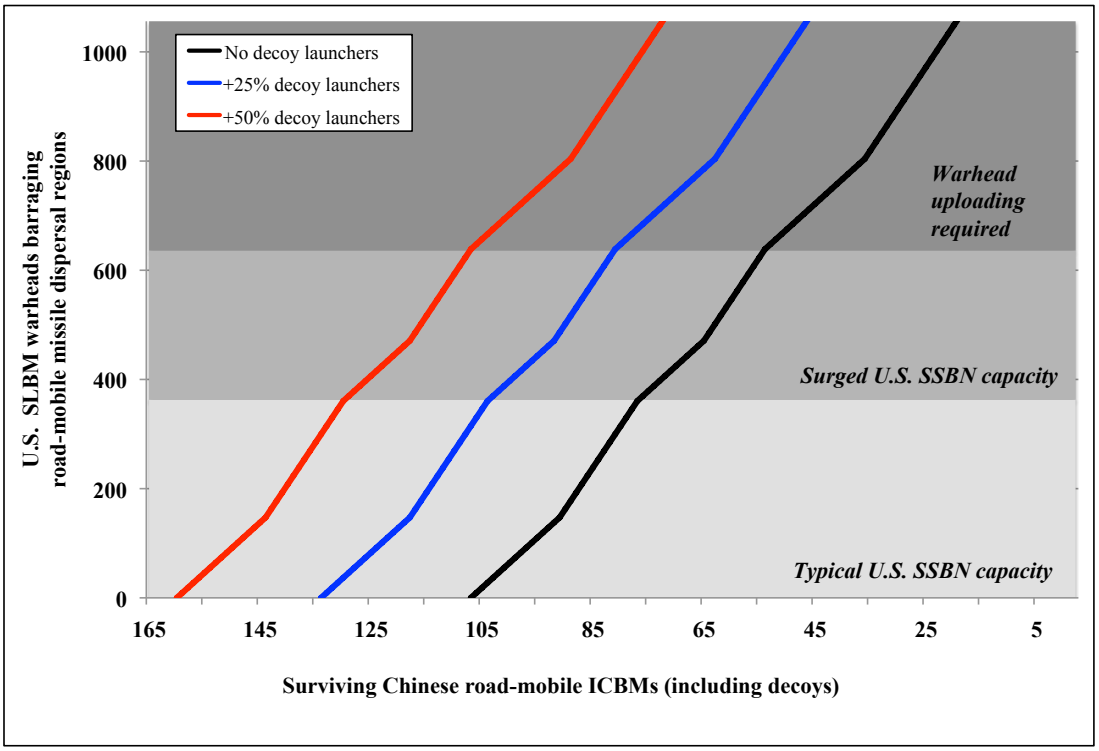

Figure 9. U.S. SLBM warheads needed to destroy a doubled Chinese mobile ICBM force

U.S. and Chinese experts generally conclude that mutual vulnerability exists, but disagree over its durability

Most interviewees confirmed the finding calculated above that mutual vulnerability exists between the two states, essentially because U.S. first-strike capabilities against Chinese nuclear forces were perceived as limited. Particularly in the context of a generated scenario, where China has loaded warheads onto delivery vehicles and dispersed its mobile forces, a U.S. counterforce attack was expected to leave at least a few warheads available for retaliation against CONUS.[517] The core of U.S. first-strike uncertainty was linked to the difficulties inherent in hunting Chinese mobile missiles. Several interviewees invoked the example of Operation Desert Storm, implying that U.S. capabilities against relocatable targets probably had not improved greatly since the early 1990s, when the United States failed to destroy the road-mobile missiles of a heavily outmatched adversary in a flat desert.[518] Chinese mobile missiles would present a more complicated target set, given China's interest in decoy and penetration aid technologies, not to mention the more challenging Chinese terrain. Despite advances in U.S. ISR capabilities, the bottom line for all but a few participants was that the risk of Chinese retaliation following a U.S. first-strike attempt could not be driven down to zero, and as a result the United States and China currently exist in a state of mutual vulnerability.[519]

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[517] A few U.S. respondents pointed out that lower alert levels would put China's assured retaliatory capability at greater risk of destruction in the event of a U.S. first strike. At the same time, such a non-generated case or "bolt from the blue" attack was largely viewed as implausible, since any crisis in which nuclear use was considered would prompt the United States and China to raise the alert rates of their nuclear forces.

[518] Acton (2013), p. 82. Long and Green (2015), pp. 58-60, spends some time challenging the analogy between Operation Desert Storm and targeting the mobile assets of future adversaries.

[519] In other words, according to these interviews the existence of mutual vulnerability rests on the ability of Chinese nuclear forces to impart sufficient "first-strike uncertainty" in the minds of U.S. decision-makers. This suggests that China may not need to achieve – or believe that it has achieved – a state of MAD in order to secure coercive bargaining leverage against the United

However, on the question of the inescapability of U.S.-China mutual vulnerability, the interviews revealed a divide. A major point of disagreement was whether the United States has the capability and intention to pull itself out of this condition. From a historical perspective, the attention to this possibility is not unwarranted; as detailed in chapter two through chapter five, overcoming the condition was the predominant U.S. approach to its mutually vulnerable relationship with the Soviet Union during the Cold War. For Chinese interviewees, mutual vulnerability aptly described the existing balance, but there remained a serious possibility that prospective U.S. technologies could alter the strategic picture, even going so far as to resolve first-strike uncertainty in the minds of U.S. decision-makers. Most concerns centered on U.S. BMD efforts, particularly boost-phase and directed-energy programs, but other capabilities like advanced conventional strike and strategic surveillance technologies were also cited. A few U.S. participants agreed that once achieved, mutual vulnerability is not necessarily a permanent or inescapable condition. These experts also credited the potential promise of defensive technology, but the possibility that a breakthrough could significantly decrease the vulnerability of the possessing state seemed more remote and theoretical than in the Chinese perspective.

In contrast, most of the U.S. interviewees envisioned a long-term balance in line with the strategic picture portrayed in Figure 9, thereby giving prominence to the view that mutual vulnerability was likely to persist over the long term. This was accredited to a natural evolution in the Chinese arsenal, including incremental growth in the number of deployed nuclear weapons as well as improvement of capabilities like early warning and better command and control.

States, since it can do so at a lower level of capability. For this line of reasoning, see Devin T. Hagerty (1995/1996), "Nuclear Deterrence in South Asia: The 1990 Indo-Pakistani Crisis," *International Security*, Volume 20, Number 3; for its application to the Chinese arsenal, see Avery Goldstein (2000), *Deterrence and Security in the 21st Century: China, Britain, France, and the Enduring Legacy of the Nuclear Revolution* (Stanford, CA: Stanford University Press).

These perceptions were typically underwritten by a belief that invulnerability is not an achievable aim for two states with advanced nuclear arsenals. Moreover, they saw attempting to reduce or eliminate vulnerability as a futile and wasteful decision, with significant potential to create instability. For example, some participants noted that as a strategy to address U.S. vulnerability, more extensive U.S. BMD deployment would ultimately prove ineffective, since a technologically capable state like China could respond with relative ease by equipping its missiles with advanced countermeasures or (with more effort) by doubling the size of its nuclear arsenal. This group saw U.S.-China mutual vulnerability as permanent because in the nuclear domain, offensive technologies would indefinitely hold the advantage over defensive technologies.[520]

At the same time that Chinese participants worried about U.S. attempts to escape mutual vulnerability, U.S. interviewees shared concerns about Chinese intentions. These participants believed the U.S. government's apparent acceptance of mutual vulnerability as long-term might give Chinese leaders reason to think they could fight and win a limited war. With higher confidence about their ability to hold a few U.S. cities at risk, Chinese decision-makers could bet the United States would back down or out of a conflict altogether. As a result, Chinese leaders might take greater risks in times of tension than they have in the past, creating more opportunities for nuclear escalation.[521] The changing conventional balance was seen as encouraging this mindset. Historically, the United States has dominated the Asia-Pacific; any

[520] This view is highlighted routinely in the published literature. For example, see *China's Offensive Missile Forces* (2015), p. 60; Colby and Denmark (2013), p. 22, and Brad Roberts (2013), "Extended Deterrence and Strategic Stability in Northeast Asia," Visiting Scholar Paper Series, No. 1, National Institute for Defense Studies, p. 18.

[521] In other words, there is concern that Chinese leaders believe in the "stability-instability paradox." For more on the paradox in the U.S.-China context, see Elbridge Colby (2015), "Welcome to China and America's Nuclear Nightmare," *The National Interest*, January/February; Glaser (2015); Goldstein (2013); Christensen (2012); Friedberg (2012).

attempts at coercion by China could have been deterred or neutralized by the U.S. capacity to project power into the region. The situation today is markedly different due to China's investment in an "anti-access/area-denial" strategy and attendant capabilities.[522] The U.S. conventional edge over China in the region is thus in the process of waning while mutual vulnerability is emerging to thwart the U.S. ability to restrict damage to its own cities, as well as those of its allies. With less clarity about how the United States would react to or apply force in a regional conflict, the credibility of U.S. escalation strategies at the conventional level is becoming more debatable at about the same time that mutual nuclear vulnerability could prompt Chinese leaders to take a stronger line on questions of national security.

U.S.-China mutual vulnerability: concluding thoughts

Technically speaking, the U.S.-China nuclear balance today has similar implications to the U.S.-Soviet balance in the late 1950s. China's retaliatory capabilities are assured under most circumstances, but all conceivable conflict scenarios might not result in China inflicting unacceptable damage to U.S. territory. Without a significant boost in decoy mobile missile launchers, a heavily uploaded Trident SSBN force in the Pacific might be able to successfully eliminate China's ability to respond. Even if a few warheads reach CONUS, such costs might still be tolerated given the much larger blow China is likely to receive, especially if the stakes are high enough.[523] To summarize the central finding of the exchange-modeling analysis, U.S.-China

[522] Aaron L. Friedberg (2014), *Beyond Air-Sea Battle*, Adelphi Series, Volume 50, Number 444; Colby (2015).

[523] While it is difficult to think of an issue important enough for the United States to risk the destruction of a few of its cities, this doesn't mean the leaders would shy away from a conventional conflict with China in order to protect an ally. A few U.S. participants specified how the stakes for the United States or China in a regional crisis could quickly expand. For example, an incident invoking questions about freedom of navigation in the South China Sea

mutual vulnerability has emerged but it is nascent enough to possibly be overturned by the state in the numerically superior position, if the U.S. leadership chooses to try.

Though the U.S.-China balance appears to be on the verge of becoming indefinitely robust, whether it does so depends on decisions by both sides. As mentioned in the introduction, there are two broad approaches to this situation: seeking to deepen the deterrent nature of the balance by acquiring or maintaining capabilities that promise to withstand and respond to a disarming attack; or seeking to manipulate the balance by pursuing damage limitation capabilities that promise to make nuclear war more tolerable. For China, the numerical disadvantage of its strategic capabilities relative to those of the United States appears to make only the former approach a viable one. In contrast, the United States has to choose which option is best for its interests. With the Cold War experience in hindsight, how both states can manage their policies with respect to mutual vulnerability in a manner most conducive to stability will be considered in the following and final chapter.

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could turn into a "litmus test" of the credibility of U.S. promises in the face of nuclear-backed aggression. China was envisioned to assign even higher importance to a setting in which the two states clash since such scenarios would almost certainly take place in China's backyard. Should China's definition of its key national interests grow, its leaders might be more inclined to calculate that a certain situation threatens those interests. If the case is egregious enough from the Chinese perspective to warrant the use of force, interview participants speculated that those leaders would expect to pay severe costs for the decision to move forward. Such costs may seem understandable in a crisis over an issue like Taiwan, where the survival of the Chinese regime could be at stake.

Chapter 8: Conclusion

Two states enter into a mutually vulnerable situation when an exchange between their nuclear capabilities would cause extraordinary damage to both sides. In theory, such states can either accept or reject the permanence of this situation. In its ideal form, acceptance would amount to maintaining one's own secure second-strike forces while avoiding attempts to negate reciprocal capabilities by the adversary. In contrast, rejection would feature the development of damage limitation capabilities well suited for making nuclear war more bearable, such as heavy, highly accurate missiles and potentially perfect defenses (e.g., BMD, air defenses, civil defenses). The job of this dissertation was to obtain a rough sense of which approach the Cold War superpowers tended to adopt, and the extent to which the United States and China today are likely to follow suit.

Ultimately, like most research endeavors what should happen in theory is not exactly what is typically found to happen in practice. In reality neither the United States nor the Soviet Union always took steps that exclusively aligned with acceptance or rejection of the strategic circumstances. Each side made hundreds of decisions related to nuclear strategy or force posture throughout the Cold War; some of these choices classified as acceptance, while others can be more accurately described as rejection. For example, at the same time that the Carter Administration approved PD-59, officials also tried to base the new MX missile on a mobile platform and signed a second major nuclear arms control agreement with the Soviets. The first of these actions is consistent with rejecting mutual vulnerability, while the latter two steps are more in line with what an accepting state would do. In other words, preferences for accepting and rejecting mutual vulnerability can manifest simultaneously, making it difficult to definitively attribute a coherent choice to a particular set of decision-makers at a particular time.

That being said, it is still possible to approximate where rival states fall along the acceptance-rejection spectrum given their general reaction to the potential tolerability of nuclear war outcomes. To capture this phenomenon the current dissertation surveyed how U.S., Soviet, and Chinese actors might or did consider three major issues: models of current and future nuclear war; the effectiveness of damage limitation techniques; and the future malleability of the strategic balance. Taken together, the overall assessment of these issues implied a judgment about whether the current or likely future array of opposing capabilities would permit a situation in which one side could emerge from a nuclear war in a relatively better position. If the observed answer to this question was "yes," a particular group of policy actors had rejected the inescapability of mutual vulnerability. If the observed answer to this question was "no," that group had accepted that the strategic situation was highly likely to endure.

U.S.-Soviet mutual vulnerability during the Cold War

According to this framework, the permanence of mutual vulnerability was largely resisted by both superpowers during the Cold War. For most of this time Soviet leaders maintained that the damage from nuclear war could be managed. Beginning in earnest in the mid-1960s, they sought capabilities that they believed would ensure the survival of the Soviet state after such a conflict. With respect to Soviet nuclear forces this meant shrinking and eventually reversing the numerical disparity between U.S. and Soviet missile capabilities. It was not until the early 1980s that the idea of the consequences of nuclear war as inescapable really seemed to gain traction. Meanwhile, there was never a dominant consensus among U.S. officials that nuclear war would definitely result in an unacceptable level of destruction on home territory. Through the mid-1960s the United States essentially tried to build its way out of the strategic situation, greatly

expanding its stockpile and delivery capabilities. During the second half of the Cold War, when an all-out nuclear exchange with the Soviet Union had been deemed prohibitively costly, a small but powerful group of policy officials repeatedly modified U.S. strategy in order to capitalize on situations short of large-scale nuclear war so population losses could be palatable. When the Soviet Union collapsed U.S. notions of winning a nuclear war receded along with questions about its infeasibility.

This finding contrasts with existing work arguing that over time the United States and Soviet Union accepted the permanence of the strategic dilemma they faced.[524] Based on the historical analysis here, the enduring nature of mutual vulnerability did not have a leveling effect on the superpower nuclear rivalry. Rather than convince the two states that it would be in their best interest to seek assured retaliatory capabilities and nothing more, mutual vulnerability motivated both to attempt to liberate themselves from the strategic dilemma, either by expanding capabilities or modifying strategy. Why was this so?

The role of nuclear war models was ambiguous. Policy actors that both accepted and rejected the enduring nature of mutual vulnerability seemed to employ such calculations to their advantage. Soviet strategic assessments were not available until the late 1960s, at which point they offered the leadership a brief glimpse of the true devastation that would accompany a nuclear war. The highest levels of government immediately pushed back against these realities, and for the next decade modeling efforts were deliberately manipulated to make nuclear war appear more tolerable. Credible calculations of the effects associated with large-scale nuclear exchanges did not penetrate the decision-making process until the early 1980s, when the notion

[524] For example, see Adler (1992), which argues this acceptance was responsible for the first major arms control efforts. Weber (1990) offers a similar perspective. Another author posits that conventional wisdom about the Cold War tends to portray the Soviets as denying mutual vulnerability and the United States as accepting it; see Battilega (2004), p. 151.

of a robust strategic balance became part of the predominantly defensive strategic concept emphasized by Gorbachev.

In the United States the strategic assessment business got its start almost twenty years before Soviet efforts and was much more elaborate. While the portrayal of the balance by U.S. entities was more accurate, their analyses also ended up serving the interests of groups that had accepted and rejected the durability of the balance. From the mid-1950s onward, notions that the United States could come away from a nuclear war with less than a few million casualties were delusory; losses on the order of 70 million lives was more likely. By 1963 models stressed that regardless of the exchange parameters, neither superpower could emerge from a large-scale nuclear war without incurring unacceptably high levels of damage. While this conclusion strengthened the convictions of policy actors like Secretary of Defense Robert McNamara, who had accepted the inescapability of the balance, officials who rejected the entrenched strategic circumstances also drew on models that justified their position. Notable examples include two analyses by the DOD – one in 1961 by Paul Nitze's group at International Security Affairs, and one in 1975 by the staff of Secretary of Defense James Schlesinger. Both of these studies suggested that under favorable circumstances, the toll from a nuclear war might be reduced to tolerable levels.

U.S. and Soviet rejection of mutual vulnerability as durable is thus better explained by confidence on either side that nuclear war's effects could be limited enough to enable victory. These beliefs were rooted in a combination of ideological, institutional and domestic political factors. In the Soviet Union, views about damage limitation were shaped by the Marxist-Leninist ideology, which demanded unquestioned loyalty to the notion that socialism was certain to triumph over capitalism, even in nuclear war. The expansion of Soviet nuclear forces to achieve

such a result also bolstered the political influence of domestic juggernauts like the defense industry and the military. It was only when the ideological and bureaucratic backing for the pursuit of Soviet superiority weakened in the early 1980s that the notion of an inescapable strategic situation really took hold.

The debate over the state's wherewithal to make nuclear war bearable was more intense in the United States. Prior to the mid-1960s, DOD and JCS officials were the strongest supporters of the objective of winning even if such an outcome meant the loss of tens of millions of Americans. These groups had an institutional interest in advocating the tolerability of nuclear war, since arming the United States to take on such an endeavor augmented their budgets and political influence. In the 1970s the primary figures advocating this view were successive national security advisors. For Henry Kissinger and Zbigniew Brzezinski, a toll of several million lives was both possible and acceptable, at least relatively more so than the minimum U.S. casualties expected to accompany large-scale nuclear war (which they saw as a contingency separate from how their idea of LNO would play out). These perceptions were often rooted in the concern that the United States lacked the tools to deter a Soviet leadership that was not resigned to a robust strategic situation, and instead sought to manipulate the nuclear balance to their advantage.

At the same time, from the mid-1950s onward there were non-trivial pockets of senior policy-makers in the United States that did seem to recognize the nuclear balance as the resilient over the long term. Eisenhower's national security advisor, secretary of state, and chief of naval operations, believed that it would be impossible to come up with a permanent solution to the problems presented by a nuclear stalemate. Under Kennedy these doubts were echoed by those of the White House staff and secretary of defense. During the Nixon and Carter Administrations,

similar challenges came from a number of important entities, including the State Department, the NSC, the CIA, and some parts of the DOD. However these groups never argued for the force posture necessitated by mutual vulnerability in a unified or coherent fashion. As a result their views were typically disregarded, never compelling enough to become actual policy.

U.S.-China mutual vulnerability today

Compared to the Cold War experience, the essential question about the U.S.-China rivalry today is: can they do better? The answer is undoubtedly affirmative. Both states are capable of reinforcing the aspects of mutual vulnerability that can enhance its durability, primarily by seeking only to maintain secure second-strike capabilities vis-à-vis one another, and foregoing damage limitation capabilities or perfect defenses. Though contrasting attitudes on the robustness of the balance suggest these two states may fall into a similar pattern as the United States and Soviet Union, there are at least two major reasons to believe that U.S.-China relations will veer away from a more competitive trajectory.

First, domestic contingents on both sides of the U.S.-China balance appear to subscribe to the logic of long-term mutual vulnerability. This was made evident by interviews with former U.S. officials and experts, most of who saw the balance as robust and unlikely to change. Furthermore, Chinese nuclear policy and forces have long appeared consistent with acceptance of this condition.[525] From the perspective of this dissertation, the central reason for the buildup of

[525] China's interest in mutual vulnerability as an explicit basis for security relations with the United States is well known. See Thomas Fingar and Fan Jishe (2013), "Ties that Bind: Strategic Stability in the U.S.-China Relationship," *The Washington Quarterly*, Vol. 36, No. 4, p. 126; Lewis (2012); Linton F. Brooks (2011), "Looking to the future: The post-New Start world and potential Sino-U.S. confidence building measures," Working paper presented at the *Sixth U.S.-China Strategic Dialogue on U.S. – China Strategic Nuclear Dynamics*, Center for Strategic and

U.S. and Soviet nuclear forces was superpower resistance to the notion that there was little recourse to reducing their vulnerability to catastrophic attack. Probably the biggest difference between the two cases is therefore that one of the participants in the contemporary rivalry has spent its entire existence as a nuclear weapons state in the numerically inferior position. Thus, the idea of an inescapable strategic situation is much more likely to factor into U.S. and Chinese force posture decisions today than it was during the Cold War.

Second, though the future trajectories of U.S. and Chinese strategic programs appear increasingly interdependent, with the latest updates to each side's defense program seeming to stoke fears about an arms race, the two sets of capabilities are less tightly coupled than U.S. and Soviet forces were.[526] Experts familiar with the incentives behind China's nuclear modernization routinely point to its independent underlying mechanisms.[527] Unlike the pace of the Soviet pursuit of strategic superiority from the 1960s onwards – as well as in contrast with the tempo of China's own conventional buildup – Chinese nuclear forces have evolved gradually, typically befuddling international projections. With respect to the U.S. strategic arsenal, China is only one of several countries that factors its posture and plans. As a consequence, should the United States or China take steps (or be perceived to take steps) that are inconsistent with acceptance of mutual vulnerability as enduring, such actions should be less likely to incite a "tit-for-tat" arms dynamic than they would have been during the Cold War.

International Studies, p. 3; Lora Saalman (2011), *China & The U.S. Nuclear Posture Review*, The Carnegie Papers, Carnegie-Tsinghua Center for Global Policy, p. 1.

[526] Gerry Mullany and Chris Buckley (2017), "China Warns of Arms Race After U.S. Deploys Missile Defense in South Korea," *New York Times,* March 7; Joel Gehrke (2017), "Tom Cotton: US has to win nuclear 'arms race' with Russia and China," *Washington Examiner*, June 26; William J. Broad and David E. Sanger (2016), "Race for Latest Class of Nuclear Arms' Threatens to Revive Cold War," *New York Times*, April 17.

[527] Chris Buckley (2017), "Why U.S. Antimissile System in South Korea Worries China," *New York Times*, March 11; Cunningham and Fravel (2015), p. 8.

At the same time that some factors are pulling the United States and China away from a Cold-War style relationship, other dynamics are simultaneously pushing the two states into a more competitive arrangement. As suggested by the interview data, this phenomenon is mainly driven by questions about whether the United States rejects or will reject an enduring, mutually vulnerable relationship with China, and the steps U.S. policy-makers could take to roll back the relationship to one resembling the asymmetry of the past. To be fair, in U.S. policy circles a mutually vulnerable relationship with China is not a universally accepted notion. The U.S. government does not publicly acknowledge that mutual vulnerability exists, opting instead for a position of tacit recognition or informal acceptance.

China takes official U.S. unwillingness to recognize mutual vulnerability as an indication that it is working to deny Chinese second-strike forces, or at least leaving the door open to do so. The interviews informing this dissertation suggest that Chinese concerns about U.S. intentions to pull itself out of mutual vulnerability are particularly acute. There remains a strong suspicion that prospective U.S. technologies will alter the strategic picture, even going so far as to resolve first-strike uncertainty in the minds of U.S. decision-makers. Thus far China has not sought to redress its position vis-à-vis the United States in the same way the Soviet Union did in the 1960s and 1970s, but such an effort would not be beyond China's reach should it decide to embark on it.[528,529]

To illuminate the root of these dynamics, it is important to understand why, in the United States today, the costs of openly recognizing mutual vulnerability with China are clearer and

[528] A separate analysis by the author has demonstrated that attempting to reach parity with the United States would take China roughly 10 to 20 years. See Caroline R. Milne, "Sprint or marathon? China's potential path to nuclear parity with the United States," working paper.
[529] There is also some concern that China's apparent acceptance of long-term mutual vulnerability may change. See Cunningham and Fravel (2015), p. 8.

greater than the potential benefits. A comparison with the Cold War case suggests there are at least three reasons. First, even if most U.S. policy actors do accept mutual vulnerability as permanent, there are concerns that explicit endorsement could reduce U.S. coercive bargaining leverage in a future crisis and embolden Chinese behavior. Second, a shift in U.S. policy toward more open acceptance of mutual vulnerability could also damage the credibility of extended deterrence in the eyes of U.S. allies. Third, within a subset of the U.S. policy community there appears to be a lingering preference for basing U.S. deterrent relationships on the idea of primacy or superiority; as such, recognizing mutual vulnerability with China is likely to provoke domestic political opposition.[530]

That being said, the risks of escalatory dynamics between U.S. and Chinese strategic programs will likely increase unless more is done to manage the relationship in ways that better reconcile with the balance's potential permanence. Accordingly this section explores three consultative steps the United States could take to engender a deeper appreciation of mutual vulnerability's significance, all of which would not necessarily require explicit acknowledgement of the condition.

First, the realities of the current U.S.-China nuclear balance suggest that mutual vulnerability should be incorporated into internal U.S. government efforts to outline what versions of strategic stability between the two states might look like.[531] Strategic stability with China – a stated goal of U.S. policy – can provide a meaningful basis for U.S.-China nuclear

[530] Christopher F. Chyba and J.D. Crouch (2009), "Understanding the U.S. Nuclear Weapons Policy Debate," *The Washington Quarterly*, Volume 32, Number 3, pp. 23-24.
[531] For more on mutual vulnerability as a key component of U.S.-China strategic stability, see Fingar and Fan (2013), pp. 132-133.

relations only if its key determinants are carefully defined.[532,533] Current U.S. policy on the composition of strategic stability with China is not clear, with decision-makers reportedly waiting for collaborative opportunities with their Chinese counterparts.[534] While the understanding of U.S.-China strategic stability should ultimately be the product of a bilateral discussion, developing an internal position on strategic stability could decrease the likelihood that the eventual bilateral discussion will be more politically than substantively driven. To inform future U.S.-China talks on strategic stability, an interagency process focused on the meaning of U.S.-China mutual vulnerability for U.S. threat assessment and force-planning mechanisms should begin now. A few interviewees noted that mutual vulnerability is already inherent in some of these processes; a more dedicated discussion could build on such efforts to make the internal consideration of U.S.-China mutual vulnerability a broader endeavor.

Part of the challenge will be detaching strategic stability from the Cold War context in which the idea emerged. The United States and China will not approach nuclear issues in the numerical parity-based manner that characterized superpower relations. The gap between the sizes of the two states' arsenals means U.S.-China strategic stability will instead operate on a

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[532] Several policy documents stipulate that the United States has an interest in maintaining strategic stability with China; for example, DOD (2010), *Nuclear Posture Review Report* (Washington, DC), April, pp. 4, 29, and DOD (2013), p. 3. However, it remains unclear whether strategic stability can provide the basis for the relationship; see Brad Roberts (2013), "Extended Deterrence and Strategic Stability in Northeast Asia," Visiting Scholar Paper Series, Number 1, National Institute for Defense Studies, p. 30. For a compelling case in support of strategic stability as the conceptual foundation for U.S.-China relations, see Elbridge A. Colby and Wu Riqiang (2016), "Seeking Strategic Stability for U.S.-China Relations in the Nuclear Domain," in U.S.-China Relations in Strategic Domains, Travis Tanner and Wang Dong, eds. (Washington D.C.: National Bureau of Asian Research), Special Report #57, pp. 21-41.

[533] Pavel Podvig (2012), "The myth of strategic stability," *Bulletin of the Atomic Scientists*, October 31. A thorough discussion of challenges inherent in defining strategic stability today can be found in Elbridge A. Colby and Michael S. Gerson (2013), eds., *Strategic Stability: Contending Interpretations* (Carlisle, PA: Strategic Studies Institute and U.S. Army War College Press).

[534] Roberts (2013), p. 13.

"highly asymmetric basis."[535] Replacing parity with mutual vulnerability in the (for now, internal) definition of strategic stability has several advantages for the United States, including a more predictable relationship with China over time and less uncertainty about the future evolution of Chinese capabilities. Furthermore, a point made during the interview process was that mutual vulnerability could represent a useful metric for multilateral nuclear diplomacy. Emphasis during bilateral discussions now on limits grounded in mutual vulnerability could facilitate future arms control efforts with more than two nuclear powers, where quantitatively even ceilings among all participants would likely present a major challenge.[536]

The second way the United States could better manage mutual vulnerability with China relates to extended deterrence commitments. Perhaps the most significant argument against more open acknowledgment of the condition is that countries like Japan and South Korea would perceive the United States as less able or willing to come to their aid should tensions with China arise.[537] Upholding the credibility of its nuclear umbrella is not a new issue for the United States; it faced a similar challenge with respect to Western Europe allies throughout the Cold War.[538] Yet the present task of reassurance is thornier. Although the United States is not locked in a struggle with China for global supremacy, the stakes of a future U.S.-China conflict could become high over time. U.S. interests in the region are also more ambiguous today; because the Asia-Pacific is a predominantly maritime domain, U.S. responsibilities to its allies are more fluid

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[535] Michael O. Wheeler (2014), *Track 1.5/2 Security Dialogues with China: Nuclear Lessons Learned*, Institute for Defense Analyses (IDA) Paper P-5135, p. 32.

[536] The insufficiency of numerical parity as the basis for nuclear arms control agreements was increasingly apparent leading up to and during New START negotiations between the United States and Russia. It was clear that future efforts would need to consider categories of weapons in which one side had a significant numerical advantage over the other and as a result, parity would represent a less attractive negotiating metric.

[537] Japanese concerns of this nature are outlined in Roberts (2013), pp. 29-33.

[538] For example, see Minutes of Review Group Meeting (1969), May 29, *FRUS 1969-1972*, Vol. XXXIV, National Security Policy, Document 32.

than they were in Europe, where U.S. and Soviet allies were literally separated by a wall. U.S. resolve on behalf of its allies and partners may thus appear more tenuous in the face of a capable and assertive China than it was when addressing the threat of the Soviet Union.

U.S. policy-makers ought to leverage current consultative processes with allies in the Asia-Pacific to distinguish between what the loss of U.S. first-strike capabilities against China does and does not mean for their national security.[539] As Chinese capabilities grow, the United States must account for the differences between its own and allied government assessments of what is necessary to deter it. Policy-makers could start by utilizing consultative forums with U.S. allies to develop a shared understanding of potential conflict pathways with China and the signaling options that might be available for the alliance to send at graduating levels of escalation.[540] While it's tricky to predict the evolution of future crises with much certainty, these discussions would underscore the range of tools afforded by U.S. strategic capabilities that could achieve alliance mission objectives in the region, even as U.S.-China mutual vulnerability deepens.

Finally, the United States must continue to address Chinese worries about U.S. intentions to overturn mutual vulnerability and regain strategic primacy. One option that has already met with some success are the Track 1.5 and Track 2 forums that have brought together the U.S. and Chinese analytical communities for over a decade.[541] While these dialogues have provided a useful means for highlighting the opportunities and challenges in U.S.-China nuclear relations, the implications of mutual vulnerability demand Track 1 engagement between civilian or

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[539] The most notable of such mechanisms include the U.S.-Japan Extended Deterrence Dialogue and the U.S.-South Korea Extended Deterrence Policy Committee. Both efforts were founded in 2010.

[540] Roberts (2013), p. 26. See also Jeffrey Lewis (2010), "Extended Deterrence Policy Committee," Web blog post, *Arms Control Wonk*, October 19, accessed May 2016.

[541] For an overview of these efforts, see Wheeler (2014).

military representatives of the two governments.[542] The past three U.S. administrations have attempted to foster such ties, but a series of incidents and accidents have hampered progress by causing downturns in the broader relationship.[543] Despite these setbacks, those involved in the development of U.S. nuclear policy should maintain efforts to engage their Chinese counterparts.[544]

The most important subject for official U.S.-China dialogue raised by this analysis is an outline of the major components of U.S.-China strategic stability. Exploring a joint definition of the concept would entail explanation by each side of what should comprise a strategically stable relationship; consequently this discussion could facilitate a better appreciation of U.S. and Chinese intentions with respect to the nuclear balance.[545] Mutual vulnerability will have a role in U.S.-China strategic stability regardless of whether it is publically endorsed by both sides. Given the high political costs for the United States associated with explicitly recognizing the condition, U.S. policy-makers could instead opt for stressing to the Chinese that the United States will not try to change the current state of the deterrent relationship. In other words, the initial joint conceptualization of U.S.-China strategic stability could stipulate that neither side has an interest in attempting to deny the retaliatory capability of the other.

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[542] This is a recommendation of the current NUWEP; see United States DOD (2013), p. 3. Rose Gottemoeller, former U.S. Under Secretary for Arms Control and International Security, recently called for a similar effort; see Ben Lowsen (2016), "China, US Butt Heads Over Nuclear Talks," *The Diplomat*, May 24.

[543] Richard Weitz (2009), "Maritime Confrontation Highlights Troubled State of China-U.S. Defense Diplomacy," *China Brief*, Volume 9, Issue 9; Roberts (2013), p. 13; Bill Gertz (2011), "China spurns strategic security talks with U.S.," *Washington Times,* January 10.

[544] The U.S. and Chinese militaries may be establishing an official forum for the discussion of strategic stability. See Colby and Wu (2016), p. 32.

[545] Li Bin (2015), "Chinese Thinking on Nuclear Weapons," *Arms Control Today*, Volume 45, December.

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In closing, this dissertation has found that mutual vulnerability can be very difficult for (at least two sets of) nuclear rivals to accept in perpetuity. For a variety of reasons it is much preferable to try to solve or at least ameliorate this strategic dilemma. Accordingly, while theories about the stability of reciprocal second-strike capabilities may be elegant, they presume a lack of agency that participants will find challenging to resign themselves to.

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