



FROM THE ARCHIVE

In 2014 the National Institute for Public Policy published the study, *Nuclear Force Adaptability for Deterrence and Assurance: A Prudent Alternative to Minimum Deterrence*. It was led by Drs. Johnny Foster and Keith Payne. This 2014 study was the second of a two-part analysis of U.S. deterrence policy and strategy. The first publication in this two-part analysis was the earlier, 2013 study led by former Defense Secretary James Schlesinger, and Dr. Payne entitled, *Minimum Deterrence: Examining the Evidence*. This initial 2013 study provided a careful and systematic deconstruction of the “Minimum Deterrence” narrative and its advocacy. The executive summary from the second publication of this two-part study published in 2014 is reprinted below. It addressed the question, “If not Minimum Deterrence, then what?” by examining the U.S. goals of deterrence, extended deterrence and the assurance of allies, and how to think about the corresponding U.S. standards of force adequacy in a worsening threat environment. From that starting point, this study identified general U.S. force posture qualities that would be most likely to enable Washington to deter and assure as effectively as possible, and could, therefore, help serve as useful guidelines for the U.S. nuclear force posture. Finally, this study linked specific recommendations for possible actions and policies consistent with those guidelines.

Now, a decade later, it is possible to see how well this set of guidelines holds up, and the degree to which Washington has adhered to, or departed from them.

NUCLEAR FORCE ADAPTABILITY FOR DETERRENCE AND ASSURANCE: A PRUDENT ALTERNATIVE TO MINIMUM DETERRENCE

**Keith B. Payne (Study Director), John S. Foster Jr. (Chair, Senior Review Group),
National Institute Press, 2014**

In Memoriam

On March 27, 2014, while this study was in its early stages, Dr. James R. Schlesinger passed away at the age of 85. Dr. Schlesinger served with enthusiasm and energy as the initial Chairman of the Senior Review Group for this work and the earlier 2013 publication in this series, *Minimum Deterrence: Examining the Evidence*. Dr. Schlesinger was very pleased with that earlier work and was comparably enthusiastic with the outline and direction of this follow-on study.

With Dr. Schlesinger’s passing, we have lost an incomparable leader, brilliant scholar, sincere patriot, generous mentor and friend, and beloved family man. He dedicated his professional life to protecting the security of the United States and Western Civilization, and the results of his efforts are nothing short of monumental. During his government career he served under Republican and Democratic presidents, including as Chairman of the Atomic Energy Commission, Director of Central Intelligence, Secretary of Defense, and the first Secretary of Energy. In 1973, at the age of 44 and the height of the Cold War, Dr.



Schlesinger became Secretary of Defense. He instituted important nuclear policy directions to strengthen the flexibility and credibility of U.S. forces for the purpose of deterring war and assuring U.S. allies. This study is indeed an extension of those directions and goals.

In David McCullough's biography of John Adams, America's second President, the author tells us that public service was "not a platitude" for Adams and his wife Abigail, but "a lifelong creed." The same surely can be said of Dr. Schlesinger. Recognition of Dr. Schlesinger's career of public service is well-reflected in the recent U.S. Senate Resolution in his honor, which passed with unanimous consent.

Following Dr. Schlesinger's passing, Dr. John Foster, Jr., former Director of Defense Research and Engineering, Department of Defense, and Director of the Lawrence Livermore National Laboratory, graciously agreed to step in as the Chairman of the Senior Review Group. He continued Dr. Schlesinger's earlier efforts on this study admirably, and I am enormously indebted to Dr. Foster for taking this work to completion with great expertise, enthusiasm and care. Dr. Foster and I consciously have worked to make this study one with which Dr. Schlesinger would be very pleased.

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*The authors are responsible for the views expressed in this report; these views do not reflect the official policy or position of the National Institute for Public Policy, the Department of Defense, or any institution with which the authors are affiliated.

**Senior Reviewers provided their comments on drafts of this report and may not be in agreement with each of its points or precise wording.

Preface

In 2013, the National Institute for Public Policy released a monograph entitled, *Minimum Deterrence: Examining the Evidence*. A bipartisan team of world-renowned civilian and military experts, led by the late Dr. James Schlesinger, contributed to this study. It identified and assessed against available evidence numerous proposals for a policy of Minimum Deterrence. The general conclusions of *Minimum Deterrence: Examining the Evidence* were that the presumptions and arguments common to Minimum Deterrence do not fare well when examined against readily available evidence.

This monograph, *Nuclear Force Adaptability for Deterrence and Assurance: A Prudent Alternative to Minimum Deterrence*, is the second in a series examining the U.S. goals of deterrence, extended deterrence and the assurance of allies, and how to think about the corresponding U.S. standards of adequacy for measuring “how much is enough?” It begins to address the question, “If not Minimum Deterrence, then what?” by examining the manifest character of the contemporary threat environment in which the United States must pursue its strategic goals of deterring foes and assuring allies. Fortunately, there is considerable available evidence regarding the character of the contemporary threat environment and its general directions. Noted historians have compared this threat environment not to the bipolar Cold War, but to the highly dynamic threat environments leading to World War I and World War II. The uncertainties involved are daunting given the great diversity of hostile and potentially hostile states and non-state actors, leaderships, goals, perceptions, and forces that could be involved.

From that starting point, this study identifies general U.S. force posture qualities that are likely to enable the United States to deter and assure as effectively as possible, and should, therefore, help serve as useful guidelines for the U.S. nuclear force posture. Finally, this study links specific recommendations for possible actions and policies consistent with those guidelines.

As with the 2013 publication, this 2014 monograph reflects the work of many hands and numerous iterations. Senior Reviewers now led by Dr. John Foster, Jr., again took their task seriously and provided literally hundreds of points to be added or deleted, corrections, and helpful suggestions with regard to precise wording. I would like to thank them and my fellow authors of initial draft sections for their careful and patient work. Similarly, I would like to express my great appreciation to the Sarah Scaife Foundation and the Smith Richardson Foundation for making this monograph series possible.

Keith B. Payne, Study Director

Executive Summary

I. Introduction

In 2013, the National Institute for Public Policy released a study entitled, *Minimum Deterrence: Examining the Evidence*. It identified and assessed against available evidence numerous proposals for a policy of Minimum Deterrence. These proposals most prominently recommend that the United States prudently can and should reduce its deployed nuclear arsenal to low or very low numbers—ranging from only a handful of deployed weapons to approximately 1,000. The general conclusions of *Minimum Deterrence: Examining the Evidence* are that the presumptions and arguments common to Minimum Deterrence do not fare well when examined against readily available evidence, and that the logic underlying Minimum Deterrence proposals often reflects significant internal contradictions.

This study begins to address the question, “If not Minimum Deterrence, then what?” by examining the manifest character of the threat environment in which the United States must pursue its strategic goals of deterring foes and assuring allies. Fortunately, there is considerable available evidence regarding the character of the current threat environment and its directions. From that starting point the study identifies general U.S. force posture qualities that are likely to enable the United States to deter and assure as effectively as possible in that threat environment, and should, therefore, serve as useful guidelines for the U.S. force posture. Finally, this study links specific recommendations for possible actions and policies consistent with those guidelines.

II. Threat Environment: A Building Block for U.S. Deterrence and Assurance Policies

There are numerous factors that should help shape the U.S. approach to deterrence and assurance. Perhaps the single most important factor is the character of the threat environment. The need for deterrence and assurance, and the character of the forces needed to support those goals must be responsive to the threat environment and trends in that environment, as well as allies’ perceptions of the environment. Thus, U.S. goals and knowledge of the actual threat environment should inform strategy, and strategy needs should drive force type, quantity and posture requirements.

The post-Cold War threat environment is highly dynamic and the attendant uncertainties that confound reliable threat forecasting loom very large. In place of the generally “ponderous and predictable” developments in the Soviet Cold War threat, the United States and allies now confront a mosaic of threats and potential threats of greatly-varying familiarity, intensity and lethality. As a 2009 Defense Science Board report

concludes, “The potential for serious surprise has reached new levels and we as a nation must be prepared to deal with it in new ways.”¹

Plausible threats exist from:

- the large nuclear powers that appear increasingly to find the international status quo unacceptable;
- smaller revisionist nuclear powers, such as North Korea;
- other hostile powers seeking nuclear capability, such as Iran;
- a wide variety of hostile and WMD-seeking terrorist organizations inspired by toxic nationalist and sectarian goals; and,
- the ever-present potential for non-linear military-technical and geopolitical developments that could significantly darken the threat environment quickly.

Noted historians have compared this contemporary threat environment not to the bipolar Cold War, but to the highly dynamic threat environments leading to World War I and World War II.² This characterization is reflected in numerous National Intelligence Council (NIC) reports and testimony by senior officials in the intelligence community.³

By way of comparison, the bipolar Cold War threat environment, while severe, was *relatively* familiar and constant from year to year. Even a brief look at contemporary developments in Russia, China, North Korea and Iran helps illustrate the reality that the emerging threat environment offers considerable opportunity for serious crises and conflicts now and in the future, including the potential for nuclear crises. The uncertainties involved are daunting given the great diversity of hostile and potentially hostile states and non-state actors, leaderships, goals, perceptions, and forces that could be involved.

The Implications of a Highly Dynamic, Uncertain Threat Environment for U.S. Deterrence and Assurance

In the context of the significant uncertainties inherent in such a dynamic threat environment, U.S. deterrence and assurance strategies, and supporting nuclear forces need to be *adaptable* to a range of threat scenarios and plausible adverse military-technical developments: when potential threats are diverse, numerous, and increasingly unpredictable, U.S. deterrence requirements are likely to be correspondingly diverse and

¹ Defense Science Board, *Capability Surprise Volume I: Main Report* (Washington, D.C.: Office of the Undersecretary of Defense for Acquisition, Technology, and Logistics, September 2009), p. 1.

² See for example, Victor Davis Hanson, “China’s Version of the Old Imperial Japan,” *The Washington Times*, January 9, 2014, p. B-3. See also the comments by Margaret MacMillan in, Ian Johnston, “Is it 1914 All Over Again?,” *The Independent*, January 5, 2014, available at <http://www.independent.co.uk-that-started-wwi-says-a-leading-historian-9039184.html>.

³ National Intelligence Council, *Global Trends 2025: A Transformed World*, (Washington D.C.: GPO, November 2008), pp. x, 3, 62, available at http://www.dni.gov/files/documents/Newsroom/Reports%20and%20Pubs/2025_Global_Trends_Final_Report.pdf. (Emphasis added).

adaptable. In practice, this means that U.S. forces must be able to deter foes and assure allies over a broad range of scenarios, including those involving military, technical and geopolitical surprise. Different approaches to deterrence, including different types of U.S. deterrent threats and supporting forces, are likely to be more (or less) credible and effective depending on the specific opponent, stakes, and other details of the contingency/crisis. U.S. forces suited only to a narrow range of threats or to niche threats could easily leave the United States without the tools necessary for defense or deterrence in a highly dynamic threat environment.

Because U.S. nuclear forces tend to have operational life spans measured in decades, the U.S. nuclear force posture must be sufficiently adaptable to deter and assure as effectively as possible in a threat environment that will see many new developments, including surprising developments, over the course of decades. If so, the United States is less likely to be caught in crises with narrowly-functioning forces ill-suited for the threats that it must confront and deter.

The United States thus must seek, as a fundamental guideline, to give its nuclear force posture the level of adaptability practicable within legal, political and economic boundaries likely to endure. This was recognized during the Cold War, but the much greater diversity of threats and dynamic character of the post-Cold War security environment now heightens considerably the need to do so.⁴ These are the fundamental building blocks, derived from available evidence, for any prudent recommendations regarding U.S. force requirements and measures of adequacy.

The implications of establishing *adaptability* as a priority guideline for the size and composition of the U.S. nuclear arsenal are indirect, but unavoidable. The capacity of the United States to adapt its deterrence and assurance strategies to widely-differing circumstances will be affected by the size and character of U.S. forces. Greater numbers do not automatically equate to greater adaptability, but retaining adaptability at ever lower force levels becomes increasingly difficult and eventually is implausible at very low force levels. Force posture numbers and characteristics should follow from that basic consideration, and U.S. arms control goals should be shaped significantly by the same consideration.

III. Requirements for a Flexible and Resilient Nuclear Force

The political and military uncertainties of the contemporary security environment point to the priority need for a U.S. nuclear force that can adapt to a range of plausible opponents, threats, conflicts, and technical challenges. The required adaptability is of two kinds: flexibility and resilience. Flexibility involves: 1) deliberate and adaptive planning for a variety of options to deter or counter attacks that present a grave danger to U.S. or allied

⁴ As is well-recognized in, Department of Defense, *Deterrence Operations Joint Operating Concept*, Version 2.0 (December 2006), pp. 7-8, available at http://www.dtic.mil/futurejointwarfare/concepts/do_joc_v20.doc.

security (nuclear strikes, extensive chemical or biological use, or overwhelming conventional offensives); and 2) forces with the diverse capabilities and the associated nuclear command and control necessary to support those deterrent threat options.

To provide flexibility, the U.S. nuclear force as a whole—Intercontinental Ballistic Missiles (ICBMs), Submarine-Launched Ballistic Missiles (SLBMs), heavy bombers, and shorter-range dual-capable aircraft (DCA)—require certain basic attributes. These include:

- **Survivability** – allows forces to withstand or escape attack on their bases and to evade or overcome enemy defenses. (Survivability can contribute both to flexibility and to resilience, but is discussed here primarily in terms of flexibility).
- **Intercontinental range** – prevents targets in enemy territory that are potentially critical for deterrence from enjoying sanctuary by virtue of being out of reach.
- **Ability to forward deploy** – allows U.S. nuclear-capable forces to deploy to locations in or near allied countries as a forward presence that can be important to both assurance and deterrence.
- **Prompt response capability** – permits the United States to hold a variety of targets at risk with a flight time of an hour or less which, in some situations, can be important for deterrence and assurance.
- **Variable payload** – provides the ability of bombers and ballistic missiles to carry different types and numbers of weapons, making possible a better matching of U.S. deterrent threats to supporting U.S. capabilities.
- **Assorted weapon yields** – allows the United States to hold at risk a wide range of target types for the purposes of deterring conflict or limiting its escalation in a variety of contingencies.
- **High delivery accuracy** – provides a critical determination of whether a weapon can hold a target at risk, as well as the yield needed to do so.
- **Nuclear command and control** – provides a robust, secure, survivable system for early warning, attack assessment, senior-leader conferencing, and force direction.

The other force quality necessary for adaptability in an uncertain world is resilience. Resilience in general is the ability to withstand, recover from, or adjust to adverse change in order to mitigate risk and maintain effectiveness.

The following are sources of resilience for the US nuclear force:

- **Strength in the extant force posture** – assures that the different elements that comprise the force structure—Ballistic Missile Submarines (SSBNs), ICBMs, bombers, and DCA—are not all vulnerable to a single type of attack. Also, peacetime alert of SSBNs and ICBMs contributes to resilience by providing insurance against a surprise attack. In addition, stockpile diversity hedges against problems with the safety, security, or effectiveness of a warhead or bomb type.

- **Adaptation within existing capabilities** – assures that the current nuclear force could be adapted to adverse military-technical or geopolitical changes through a number of measures that would not involve acquisition of new capabilities or the upgrade of existing delivery vehicles and weapons. The alert level of elements within the force structure could be raised to counter a new threat to prelaunch survivability, increase force preparedness, or help deter escalation of a crisis. Non-deployed weapons in the nuclear stockpile could also be uploaded on bombers and ballistic missiles in response to an increase in the offensive or defensive strength of an opponent, a stepped-up arms competition, or a confrontation that threatened to escalate to nuclear use.
- **Modification with hardware changes** – includes the option of adding better guidance systems for missiles (e.g., if targets become more hardened), upgraded defensive avionics for strike aircraft (e.g., if air defenses improved), and new or upgraded weapons to bombers or missiles (e.g., if targeting constraints made lower-yield weapons necessary).
- **Modernization of force elements** – allows for the new development and production for changes in quantity as well as quality in response to evolving threats.

IV. Preserving and Enhancing Adaptability

This report identifies actions the United States can consider to preserve and enhance adaptability for strategic forces. This discussion is by no means meant to be comprehensive. Rather, it offers an initial look at some possible U.S. actions consistent with establishing flexibility and resilience as priority guidelines for deterrence and assurance purposes. This list of possible actions can help defense planners with efforts already underway for nuclear force modernization, design concepts for next-generation replacement systems, and identification of goals for future arms control negotiations.

Next-generation nuclear forces are programmed to be in service until late in the twenty-first century. For example, *Ohio*-class replacement SSBNs are scheduled to be deployed until the 2080s. The natural question to consider is: “How much flexibility and resilience are enough to provide adaptability for deterrence and assurance in the decades ahead?” No definitive or static answer to that question is possible because requirements will shift with the threat environment, the extent to which allies feel assured, and the character of the opponents and contingencies in question. Nevertheless, in a highly dynamic environment, a priority goal for the United States should be to provide as much flexibility and resilience as possible, within likely practical constraints.

To enhance the adaptability of nuclear forces, this report identifies potential actions for consideration and some pertinent “to dos” and “not to dos” in support of U.S. flexibility and resilience. It is impossible to know whether a failure to follow these would lead to the

future failure of deterrence or assurance. But, without such actions the United States would likely be less able to adapt as may be necessary to shifting threat environments for the purpose of supporting the most effective deterrence and assurance strategies practicable.

Actions discussed in the report that can preserve and enhance *flexibility* include the following:

- **Survivability** – the nuclear triad should be retained to present great complexity and uncertainty to any adversary that might contemplate a disarming nuclear strike on the United States. The ability to disperse bombers and increase the alert rates of bombers and SSBNs in response to adverse technical or geopolitical changes preserves flexibility by maintaining the prelaunch survivability of the strategic nuclear force.
- **Diverse payloads and weapon yields** – currently, all U.S. nuclear weapons that provide low-yield options reside with the air-breathing weapon delivery systems. Flexibility would be enhanced by developing and certifying low-yield options for the ballistic missile legs of the triad—ICBMs and SLBMs. Also, modernization plans should include replacing or upgrading the B61-11 earth penetrating weapon.
- **Ability to forward deploy** – the United States should move ahead with nuclear certification plans for the F-35A and the B61-12 life extension program and ensure that the support infrastructure is in place for deploying DCA to threatened regions. One way to improve this flexibility-related attribute is for DoD to identify and prepare emergency nuclear weapon storage sites in appropriate regions, in addition to current European deployment sites.
- **Intercontinental range and delivery accuracy** – as forces are life extended and modernized, opportunities to improve accuracy further should continue to be a goal, whenever feasible. In particular, accuracy improvements should be included in planning for the follow-on ICBM and Long Range Stand-Off missile. Also, guidance and accuracy improvements for nuclear gravity bombs, the only “unguided” weapons in the U.S. nuclear arsenal, should be a goal.
- **Declaratory policy** – a “sole purpose” declaratory doctrine for nuclear forces or other formulations of a no-first-use policy should be avoided unless and until much more benign threat conditions exist.
- **Non-nuclear strategic capabilities** – conventional global strike offensive capabilities and ballistic missile defenses, when combined with nuclear capabilities, can provide more flexible options for the president during a crisis. Non-nuclear strategic capabilities—both offensive and defensive—should continue to be developed and, when ready, deployed.

Actions that can preserve and enhance *resilience* include the following:

- **Force structure composition and sizing** – over the near- to mid-term, an upload hedge capability and a non-deployed stockpile of warheads will be needed for the nuclear force to provide important options for resilience. Therefore, for at least the next decade—until the nuclear weapons complex is modernized and fully operational—arms control negotiations should include the goals of protecting the U.S. nuclear force structure and preserving a hedge capacity.
- **Next-generation weapon systems** – planning for nuclear force modernization should include the need for adaptability when developing replacements for existing nuclear weapons systems. Studies for nuclear force modernization, including the *Ohio*-class replacement SSBN, follow-on ICBM, Long Range Strike-Bomber, and Long Range Stand-Off missile, should consider an extra margin of weight and volume for potential future payload needs.
- **Nuclear command and control** – potential adversaries are actively developing cyber and counter-space capabilities to disrupt and deny U.S. command-and-control capabilities. The U.S. nuclear command-and-control system should be modernized to protect against obsolescence and emerging vulnerabilities. More detailed actions are outlined in the body of the report.
- **Nuclear weapon developments** – innovation at the national laboratories in nuclear weapon design, production and employment should be encouraged, not discouraged. The national laboratories should explore the potential for new development to sharpen technical skills, understand what adversaries might be developing, and be responsive to rapidly emerging needs. Low-cost studies and prototyping can provide benefits important for resilience.
- **Defense industrial base** – modernization of the nuclear weapons infrastructure—especially that supporting uranium and plutonium operations in the manufacture of nuclear warheads—should proceed without delay. In addition, development and production of non-nuclear strategic capabilities, discussed earlier for flexibility, can also enhance the responsiveness of the industrial base by sustaining activity in the industrial base for weapon guidance systems and solid rocket motors.
- **Arms control policies** – in addition to protecting force structure, hedge capacity, and a non-deployed stockpile, all future arms control initiatives should be examined carefully by a “red team” for potential unintended consequences that would degrade U.S. flexibility and resilience.

A more complete list of potential actions to preserve and enhance adaptability—flexibility and resilience—are summarized in Table ES-1 and discussed in greater detail in the body of the report.

Table ES-1: Actions that Could Protect and Enhance Flexibility and Resilience

Category	Action
Force Structure	
	Maintain the triad; preserve force structure
	Retain upload hedge capability, e.g., empty ICBM silos, ability to re-MIRV ICBMs
	Retain DCA (nuclear-capable F-35; B61-12)
	Designate and prepare contingency nuclear storage sites and bomber dispersal bases
Force Modernization	
	Modernize all triad legs
	Emphasize adaptability in modernization plans
	Base future force composition and size on policy goals for deterrence and assurance, recognizing the need for adaptability
	Upgrade accuracy of weapons
	NC2: Upgrade senior leader conferencing, early warning systems, and robustness of secure communications to strategic forces
	Develop prompt conventional global strike capabilities
Force Posture	
	Reject de-alerting proposals
	Maintain upload potential
	Develop ability to more quickly increase readiness of deployed DCA
	Use exercises/war games to evaluate options for adaptability
Warhead Stockpile	
	Retain non-deployed stockpile for hedge/upload
	Life extend or modernize B61-11 EPW
	Develop low-yield options for SLBMs and ICBMs
	Demonstrate competence for “new” nuclear capabilities
Infrastructure	
	Modernize nuclear warhead infrastructure
	Encourage innovation, studies, prototyping
	Develop non-nuclear capabilities
Declaratory Policy	
	Avoid “sole purpose” and “no first-use” policies, given their likely detrimental effect on flexibility and deterrence
Arms Control	
	In light of deterrence and assurance requirements, assess prospective arms control steps carefully, according to the priority goal of preserving or strengthening adaptability; identify and consider warily arms control steps and goals that would force tradeoffs degrading adaptability.