



2022 Nuclear Posture Review



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I. A COMPREHENSIVE, BALANCED APPROACH TO DEFENDING VITAL NATIONAL SECURITY INTERESTS AND REDUCING NUCLEAR RISKS

This Nuclear Posture Review (NPR) describes United States nuclear strategy, policy, posture, and forces in support of the National Security Strategy (NSS) and National Defense Strategy (NDS). It reaffirms a continuing commitment to a safe, secure, and effective nuclear deterrent and strong and credible extended deterrence. Strategic deterrence remains a top priority mission for the Department of Defense (DoD) and the Nation. For the foreseeable future, nuclear weapons will continue to provide unique deterrence effects that no other element of U.S. military power can replace. To deter aggression and preserve our security in the current security environment, we will maintain nuclear forces that are responsive to the threats we face.

U.S. nuclear weapons deter aggression, assure allies and partners, and allow us to achieve Presidential objectives if deterrence fails. In a dynamic security environment, a safe, secure, and effective nuclear deterrent is foundational to broader U.S. defense strategy and the extended deterrence commitments we have made to allies and partners. Security architectures in the Euro-Atlantic and Indo-Pacific regions are a critical U.S. strategic advantage over those governments that challenge the rules-based international order. These regional security architectures are a key pillar of the NDS; this NPR underscores the linkage between the conventional and nuclear elements of collective deterrence and defense.

Deterrence alone will not reduce nuclear dangers. The United States will pursue a comprehensive and balanced approach that places a renewed emphasis on arms control, non-proliferation, and risk reduction to strengthen stability, head off costly arms races, and signal our desire to reduce the salience of nuclear weapons globally. Mutual, verifiable nuclear arms control offers the most effective, durable and responsible path to achieving a key goal: reducing the role of nuclear weapons in U.S. strategy. Despite the challenges in the current security environment, the United States will continue to pursue engagement with other nuclear-armed states where possible to reduce nuclear risks. We will do so with realistic expectations, understanding that progress requires reliable partners prepared to engage responsibly and on the basis of reciprocity, and with whom we can establish a degree of trust.

Russia's invasion of Ukraine underscores that nuclear dangers persist, and could grow, in an increasingly competitive and volatile geopolitical landscape. The Russian Federation's unprovoked and unlawful invasion of Ukraine in 2022 is a stark reminder of nuclear risk in contemporary conflict. Russia has conducted its aggression against Ukraine under a nuclear shadow characterized by irresponsible saber-rattling, out of cycle nuclear exercises, and false narratives concerning the potential use of weapons of mass destruction (WMD). In brandishing Russia's nuclear arsenal in an attempt to intimidate Ukraine and the North Atlantic Treaty Organization (NATO), Russia's leaders have made clear that they view these weapons as a shield behind which to wage unjustified aggression against their neighbors. Irresponsible Russian

statements and actions raise the risk of deliberate or unintended escalation. Russia's leadership should have no doubt regarding the resolve of the United States to both resist nuclear coercion and act as a responsible nuclear power.

As long as nuclear weapons exist, the United States and other nuclear weapon states have a special charge to be responsible custodians of these nuclear capabilities and work with a sense of urgency to create a security environment that would ultimately allow for their elimination. Nuclear weapons have not been employed in more than 75 years. While ensuring our security, our goal is to extend this record of non-use and reduce the risk of a nuclear war that could have catastrophic effects for the United States and the world.

Mindful of this imperative, in 2022 the leaders of the five declared Nuclear Weapon States (France, People's Republic of China, Russian Federation, United Kingdom, United States (P5)) affirmed that a nuclear war cannot be won and must never be fought, and that nuclear weapons should serve defensive purposes, deter aggression, and prevent war. The P5 leaders also reaffirmed their commitment to their disarmament-related obligations under the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) and their intent to strengthen stability and prevent an arms race. Russia's rhetoric and actions in Ukraine are inconsistent with and undermine this P5 statement. China also has a responsibility as an NPT nuclear weapons state and a member of the P5 to engage in talks that will reduce the risks of miscalculation and address destabilizing military dynamics.

The United States is committed to the modernization of its nuclear forces, nuclear command, control, and communications (NC3) system, and production and support infrastructure, and to sustaining fielded systems through the transition to their replacements. Our principal competitors continue to expand and diversify their nuclear capabilities, to include novel and destabilizing systems, as well as non-nuclear capabilities that could be used to conduct strategic attacks. They have demonstrated little interest in reducing their reliance on nuclear weapons. By contrast, the United States is focused on the timely replacement of legacy fielded systems that are rapidly approaching their end of service life.

The NPR identifies current or planned nuclear capabilities that are no longer required to meet our deterrence needs. Additionally, consistent with its concept for integrated deterrence, DoD will seek to identify and assess the ability of non-nuclear capabilities to contribute to deterrence, and will integrate these capabilities into operational plans, as appropriate. While we are taking steps to advance the goal of reducing reliance on nuclear weapons, more far-reaching opportunities to move in this direction will require enduring improvement in the security environment, a commitment to verifiable arms control among the major nuclear powers, further progress in developing non-nuclear capabilities, and an assessment of how nuclear-armed competitors and adversaries may react. The United States is committed to making progress toward this goal as security, political, and technology conditions evolve in ways that allow us to do so.

Meeting our nuclear policy goals would not be possible without a capable, motivated workforce. The military and civilian personnel who work every day in the nuclear enterprise are a national

asset whose accomplishments are rarely seen but vitally important. Preparing the next generation of deterrence and arms control leaders across the government and among Allies and partners is a critical task. We will sustain and strengthen activities to recruit, retain, and support the professional development of Service members and civilians working in and supporting the nuclear field.

The 2022 NPR has made the following decisions to ensure a safe, secure, and effective deterrent while taking responsible steps to advance the goal of reducing the role of nuclear weapons in U.S. strategy. This approach offers a sound path toward sustained security and stable deterrence.

- ▶ Adopt a strategy and declaratory policy that maintain a very high bar for nuclear employment while assuring Allies and partners, and complicating adversary decision calculus.
- ▶ Adopt an integrated deterrence approach that works to leverage nuclear and non-nuclear capabilities to tailor deterrence under specific circumstances.
- ▶ Eliminate “hedge against an uncertain future” as a formal role of nuclear weapons.
- ▶ Take steps to strengthen extended deterrence and Allied assurance.
- ▶ Pursue enhanced security through arms control, strategic stability, non-proliferation, and reducing the risks of miscalculation.
- ▶ Affirm full-scope Triad replacement and other nuclear modernization programs, including NC3.
- ▶ Retire the B83-1 gravity bomb.
- ▶ Cancel the nuclear-armed Sea-Launched Cruise Missile (SLCM-N) program.
- ▶ Deliver a modern, adaptive nuclear security enterprise based on an integrated strategy for risk management, production-based resilience, science and technology innovation, and workforce initiatives.

II. THE SECURITY ENVIRONMENT AND DETERRENCE CHALLENGES

The NPR contributes to a broader strategic framework that recognizes the growing risk of military confrontation with or among nuclear powers and the urgent need to sustain and strengthen deterrence. In large part due to the actions of our strategic competitors, the international security environment has deteriorated in recent years. The People's Republic of China (PRC) is the overall pacing challenge for U.S. defense planning and a growing factor in evaluating our nuclear deterrent. The PRC has embarked on an ambitious expansion, modernization, and diversification of its nuclear forces and established a nascent nuclear triad. The PRC likely intends to possess at least 1,000 deliverable warheads by the end of the decade.

While the end state resulting from the PRC's specific choices with respect to its nuclear forces and strategy is uncertain, the trajectory of these efforts points to a large, diverse nuclear arsenal with a high degree of survivability, reliability, and effectiveness. This could provide the PRC with new options before and during a crisis or conflict to leverage nuclear weapons for coercive purposes, including military provocations against U.S. Allies and partners in the region.

Russia continues to emphasize nuclear weapons in its strategy, modernize and expand its nuclear forces, and brandish its nuclear weapons in support of its revisionist security policy. Its modern nuclear arsenal, which is expected to grow further, presents an enduring existential threat to the United States and our Allies and partners. For more than twenty years, Russia has pursued a wide-ranging military modernization program that includes replacing legacy strategic nuclear systems and steadily expanding and diversifying nuclear systems that pose a direct threat to NATO and neighboring countries. This includes up to 1,550 accountable deployed warheads on strategic delivery vehicles that are limited by the New START Treaty, as well as nuclear forces that are not numerically constrained by any arms control treaty. For example, Russia has an active stockpile of up to 2,000 non-strategic nuclear warheads that is not treaty-limited. Similarly, Russia is pursuing several novel nuclear-capable systems designed to hold the U.S. homeland or Allies and partners at risk, some of which are also not accountable under New START.

By the 2030s the United States will, for the first time in its history, face two major nuclear powers as strategic competitors and potential adversaries. This will create new stresses on stability and new challenges for deterrence, assurance, arms control, and risk reduction.

The PRC and Russia are also working to augment their growing nuclear forces with a broader set of kinetic and non-kinetic capabilities, including cyber, space, information, and advanced conventional strike. Each seeks to integrate these multi-domain capabilities to support coercive strategies and enable military campaigns intended to present the Joint Force with operational dilemmas. The PRC and Russia also likely possess capabilities relevant to chemical and biological warfare that pose a threat to U.S., Allied, and partner forces, military operations, and civilian populations.

The Democratic People’s Republic of North Korea (North Korea), while not a rival on the same scale as the PRC and Russia, nonetheless also presents deterrence dilemmas for the United States and its Allies and partners. It poses a persistent threat and growing danger to the U.S. homeland and the Indo-Pacific region as it expands, diversifies, and improves its nuclear, ballistic missile, and non-nuclear capabilities, including its chemical weapon stockpile. A crisis or conflict on the Korean Peninsula could involve a number of nuclear-armed actors, raising the risk of broader conflict.

Iran does not today possess a nuclear weapon and we currently believe it is not pursuing one. However, recent Iranian activities previously constrained by the Joint Comprehensive Plan of Action (JCPOA) are of great concern as they are applicable to a nuclear weapons program. U.S. policy is to prevent Iran from acquiring a nuclear weapon.

The acquisition of nuclear weapons by additional states could lead to new challenges for deterrence. Developments in the security environment, including actions taken by Iran and North Korea, and Russia’s aggression against Ukraine, could create or deepen proliferation incentives.

Additionally, nuclear terrorism continues to pose a threat to the United States and our Allies and partners. Terrorists remain interested in using WMD in attacks against U.S. interests and possibly the U.S. homeland. Dual-use knowledge, goods, and technology applicable to WMD continue to proliferate.

The security environment poses a number of critical challenges for deterrence.

The current and growing salience of nuclear weapons in the strategies and forces of our competitors heightens the risks associated with strategic competition and the stakes of crisis and military confrontation. As the NDS notes, we must be able to deter conventional aggression that has the potential to escalate to nuclear employment of any scale. Russia presents the most acute example of this problem today given its significantly larger stockpile of regional nuclear systems and the possibility it would use these forces to try to win a war on its periphery or avoid defeat if it was in danger of losing a conventional war. Deterring Russian limited nuclear use in a regional conflict is a high U.S. and NATO priority.

The PRC’s nuclear expansion and the changes this could bring to its strategy present new complexities. In the near-term, we must factor this into our arms control and risk reduction approaches with Russia. We also recognize that as the security environment evolves, it may be necessary to consider nuclear strategy and force adjustments to assure our ability to achieve deterrence and other objectives for the PRC – even as we continue to do so for Russia. Our plans and capabilities must also account for the fact that the PRC increasingly will be able to execute a range of nuclear strategies to advance its goals.

Opportunistic aggression could create deterrence challenges. Should we find ourselves in a large-scale military confrontation with a major power or regional adversary, the Joint Force will need to be postured with military capabilities – including nuclear weapons – that can deter and defeat other actors who may seek to take advantage of this scenario to engage in opportunistic aggression. In such circumstances, we will also need to be prepared to fully leverage other instruments of national power and the capabilities our Allies and partners can bring to bear.

Multi-domain stability challenges will grow. As all major powers develop multi-domain approaches, the United States and our Allies and partners will face new dilemmas for deterrence and managing escalation risk. One challenge arises from advances in non-nuclear capabilities, including in the cyber, space, air, and undersea domains, that likely will create complex and unpredictable pathways for conflict escalation, especially where collective experience, common understandings, and established norms of behavior (such as cyber and space) are lacking. A related challenge is the lack of collective experience and potential limited understanding of the interplay between nuclear and non-nuclear strategic capabilities in shaping a crisis or conflict.

III. THE ROLE OF NUCLEAR WEAPONS IN U.S. STRATEGY

Since the end of the Cold War, the United States has substantially reduced the size and diversity of its nuclear forces, narrowed the circumstances under which it would consider employing these forces, actively sought reciprocal force reductions with Russia, and made progress in global nonproliferation and risk reduction. Unlike some of its competitors, the United States will not use nuclear weapons to intimidate others or as part of an expansionist security policy. This policy of restraint continues to shape the role of nuclear weapons in U.S. strategy. The United States is committed to taking steps to reduce the role of nuclear weapons in our strategy as well as the risks of nuclear war, while also ensuring our strategic deterrent remains safe, secure, and effective, and our extended deterrence commitments remain strong and credible.

The Role of Nuclear Weapons. The NPR affirms the following roles for nuclear weapons:

- ▶ Deter strategic attacks;
- ▶ Assure Allies and partners; and
- ▶ Achieve U.S. objectives if deterrence fails.

These roles are interrelated and complementary and provide the basis for developing and assessing our nuclear strategies, policies, and capabilities. “Hedging against an uncertain future” is no longer a stated role for nuclear weapons. The United States will continue to carry out robust risk management strategies within the nuclear enterprise so that it is capable of delivering credible deterrence even in the face of significant uncertainties and unanticipated challenges. This requires sustaining a set of initiatives and actions in the nuclear enterprise that over time builds enduring advantage and resilience in our stockpile, production complex, and science and technology efforts. Our approach to mitigating programmatic, geopolitical, technological, and operational risk through a resilient and adaptive nuclear enterprise is discussed below.

Deter Strategic Attacks. The United States affirms that its nuclear forces deter all forms of strategic attack. They serve to deter nuclear employment of any scale directed against the U.S. homeland or the territory of Allies and partners, whether on the ground, in the air, at sea, or in space. Any adversary use of nuclear weapons, regardless of location or yield, would fundamentally alter the nature of a conflict, create the potential for uncontrolled escalation, and have strategic effects. We must therefore be able to deter both large-scale and limited nuclear attacks from a range of adversaries. The capability to deter limited nuclear attacks is critical given that some competitors have developed strategies for warfare that may rely on the threat of nuclear escalation in order to terminate a conflict on advantageous terms. The ability to deter limited nuclear use is thus key to deterring non-nuclear aggression. If we are not confident we can deter escalation, it will be more difficult for our leaders to make the decision to project conventional military power to protect vital national security interests – and far more dangerous to do so should that decision be made.

Consistent with prior reviews, our nuclear strategy accounts for existing and emerging non-nuclear threats with potential strategic effect for which nuclear weapons are necessary to deter. We concluded that nuclear weapons are required to deter not only nuclear attack, but also a narrow range of other high consequence, strategic-level attacks. This is a prudent approach given the current security environment and how it could further evolve.

Assure Allies and Partners. The NSS and NDS require strengthening security architectures in key regions in order to fully leverage the capabilities of Allies and partners to deter and, if necessary, defeat adversary aggression. The U.S. global alliance and partnership network is a military center of gravity. U.S. extended nuclear deterrence is foundational to this network. Thus, assuring Allies and partners that these commitments are credible is central to U.S. national security and defense strategy.

Allies must be confident that the United States is willing and able to deter the range of strategic threats they face, and mitigate the risks they will assume in a crisis or conflict. Modernizing U.S. nuclear forces is key to assuring Allies that the United States is committed and capable of deterring the range of threats U.S. nuclear strategy addresses. Extended nuclear deterrence contributes to U.S. non-proliferation goals by giving Allies and partners confidence that they can resist strategic threats and remain secure without acquiring nuclear weapons of their own. Part of our assurance to Allies and partners is a continued and strengthened commitment to arms control, nuclear nonproliferation, and nuclear risk reduction to improve collective security by reducing or constraining adversary capabilities.

Achieve U.S. Objectives if Deterrence Fails. We will maintain a safe, secure, and effective nuclear deterrent and flexible nuclear capabilities to achieve our objectives should the President conclude that the employment of nuclear weapons is necessary. In such a circumstance, the United States would seek to end any conflict at the lowest level of damage possible on the best achievable terms for the United States and its Allies and partners. As part of NPR implementation, the United States will update nuclear weapons employment guidance in accordance with the policy and strategy established by the President following publication of this report.

United States nuclear weapons employment guidance is approved by the President, and all nuclear plans are reviewed and approved by the Secretary of Defense. These plans are prepared with advice from the Chairman of the Joints Chiefs of Staff, among other senior officials. Legal advice is integral to the preparation of these documents and includes review of their consistency with the Law of Armed Conflict (LOAC), which is authoritatively stated for DoD personnel in the DoD Law of War Manual. Longstanding DoD policy is to comply with LOAC in all armed conflicts, however characterized, and the DoD Law of War Manual recognizes that “[t]he law of war governs the use of nuclear weapons, just as it governs the use of conventional weapons.” In addition, longstanding U.S. policy is to not purposely threaten civilian populations or objects, and the United States will not intentionally target civilian populations or objects in violation of LOAC.

Declaratory Policy. United States declaratory policy reflects a sensible and stabilizing approach to deterring a range of attacks in a dynamic security environment. This balanced policy maintains a very high bar for nuclear employment, while also complicating adversary decision calculus, and assuring Allies and partners. *As long as nuclear weapons exist, the fundamental role of nuclear weapons is to deter nuclear attack on the United States, our Allies, and partners. The United States would only consider the use of nuclear weapons in extreme circumstances to defend the vital interests of the United States or its Allies and partners.*

The United States will not use or threaten to use nuclear weapons against non-nuclear weapon states that are party to the NPT and in compliance with their nuclear non-proliferation obligations. For all other states, there remains a narrow range of contingencies in which U.S. nuclear weapons may still play a role in deterring attacks that have strategic effect against the United States or its Allies and partners.

Declaratory policy is informed by the threat, assessed adversary perceptions, Ally and partner perspectives, and our strategic risk reduction objectives. We conducted a thorough review of a broad range of options for nuclear declaratory policy – including both No First Use and Sole Purpose policies – and concluded that those approaches would result in an unacceptable level of risk in light of the range of non-nuclear capabilities being developed and fielded by competitors that could inflict strategic-level damage to the United States and its Allies and partners. Some Allies and partners are particularly vulnerable to attacks with non-nuclear means that could produce devastating effects. We retain the goal of moving toward a sole purpose declaration and we will work with our Allies and partners to identify concrete steps that would allow us to do so.

Nuclear Weapons in U.S. Defense Strategy. While the United States maintains a very high bar for the employment of nuclear weapons, our nuclear posture is intended to complicate an adversary’s entire decision calculus, including whether to instigate a crisis, initiate armed conflict, conduct strategic attacks using non-nuclear capabilities, or escalate to the use of nuclear weapons on any scale. Our nuclear deterrent thus undergirds all our national defense priorities, including defending the U.S. homeland, deterring strategic attacks against the United States, our Allies and partners, and deterring regional aggression with emphasis on the PRC and Russia. Additionally, DoD’s goal to build a resilient defense ecosystem and Joint Force bears directly on our nuclear posture. Making the overall defense enterprise more resilient requires investing in the nuclear enterprise to ensure it is capable of responding in a timely way to changes in the security environment or challenges that arise in our nuclear force.

We will deter through safe, secure, and effective nuclear forces that enable country-specific strategies and plans, extended deterrence commitments, and an integrated deterrence approach that incorporates suitable non-nuclear capabilities tailored to specific threat scenarios. This approach requires modernizing our nuclear forces, NC3, production infrastructure, and science and technology and industrial base; strengthening extended deterrence relationships; and reinforcing our nuclear forces with defenses against adversaries’ conventional, cyber, space, information, chemical, biological, radiological, and nuclear capabilities.

A key goal of integrated deterrence is to develop tailored options that shape adversary perceptions of benefits and costs. The role of nuclear weapons is well established and embedded in strategic deterrence policy and plans. Non-nuclear capabilities may be able to complement nuclear forces in strategic deterrence plans and operations in ways that are suited to their attributes and consistent with policy on how they are to be employed. A pragmatic approach to integrated deterrence will seek to determine how the Joint Force can combine nuclear and non-nuclear capabilities in complementary ways that leverage the unique attributes of a multi-domain set of forces to enable a range of deterrence options backstopped by a credible nuclear deterrent. Developing the needed operational and organizational concepts will take time and require additional research, evaluation, and experience. This will be a focus of NPR and NDS implementation.

Another important element of integrated deterrence is better synchronizing nuclear and non-nuclear planning, exercises, and operations. Our goal is to strengthen deterrence and raise the nuclear threshold of our potential adversaries in regional conflict by undermining adversary confidence in strategies for limited war that rely on the threat of nuclear escalation. When engaged in conventional operations against a nuclear-armed adversary the Joint Force must be able to survive, maintain cohesion, and continue to operate in the face of limited nuclear attacks. This form of resilience sends a distinct deterrence message to an adversary – that limited nuclear escalation will not render U.S., Allied, and partner forces incapable of achieving our warfighting aims. It is also critically important that the Joint Force can fight and win in a chemical, biological, radiological, and nuclear (CBRN)-contaminated environment. Further development of plans and force requirements to enable military operations in a nuclear environment will be a focus of NPR implementation, including requirements to ensure the resilience of conventional systems to limited nuclear use effects and enhanced mission assurance of space assets critical to conventional force operations.

DoD also seeks to integrate its activities, operations, and strategies more widely and deeply with Allies and partners to signal to adversaries that that aggression will be met with a collective response. Greater engagement with Ally and partner forces adds uncertainty and complexity to adversary planning. An adversary may choose restraint if it believes it is challenging not just the United States but a unified alliance or coalition prepared to share risks, confront aggression, and impose prohibitive costs. Extended nuclear deterrence relationships play an important role here by operationalizing collective defense that couples U.S. and Allied security and gives Allies and partners the confidence to resist coercion and vigorously defend shared interests. Even as adversaries seek to decouple the United States and its Allies, the strength of these extended deterrence relationships conveys to them the risk that local aggression could widen, with potentially catastrophic consequences.

IV. TAILORED NUCLEAR DETERRENCE STRATEGIES

Country-Specific Approaches. Central to U.S. deterrence strategy is the credibility of our nuclear forces to hold at risk what adversary leadership values most. Effectively deterring – and restoring deterrence if necessary – requires tailored strategies for potential adversaries that reflect our best understanding of their decision-making and perceptions.

The PRC is increasing its capability to threaten the United States and our Allies and partners with nuclear weapons. The range of nuclear options available to the PRC leadership will expand in the years ahead, allowing it potentially to adopt a broader range of strategies to achieve its objectives, to include nuclear coercion and limited nuclear first use. We will maintain a flexible deterrence strategy and force posture that continues to clearly convey to the PRC that the United States will not be deterred from defending our Allies and partners, or coerced into terminating a conflict on unacceptable terms. Forces that provide this flexibility include the W76-2 low yield submarine-launched ballistic missile warhead, globally-deployable bombers, dual-capable fighter aircraft, and air-launched cruise missiles. Our intent is to prevent the PRC from mistakenly concluding that it could gain advantage through any employment of nuclear weapons, however limited. The NPR recognizes that as the security environment evolves, changes in U.S. strategy and force posture may be required to sustain the ability to achieve deterrence, assurance, and employment objectives for both Russia and the PRC.

Russia remains the U.S. rival with the most capable and diverse nuclear forces. Today it is unique in the combination of strategic and non-strategic nuclear forces it fields that enables nuclear employment ranging from large-scale attacks on the homeland to limited strikes in support of a regional military campaign. To deter large-scale attacks, we will field a modern, resilient nuclear Triad. To deter theater attacks and nuclear coercion of Allies and partners, we will bolster the Triad with capabilities that further strengthen regional deterrence, such as F-35A dual-capable fighter aircraft (DCA) equipped with the B61-12 bomb; the W76-2 warhead; and the Long-Range Standoff (LRSO) weapon. These flexible, tailorable capabilities are key to ensuring that Russia's leadership does not miscalculate regarding the consequences of nuclear use on any scale, thereby reducing their confidence in both initiating conventional war against NATO and considering the employment of non-strategic nuclear weapons in such a conflict.

The PRC and Russia are at different stages in their nuclear weapons development but each poses a major and growing nuclear threat to the United States and its Allies and partners. There is some opportunity to reduce the role of nuclear weapons in our strategies for the PRC and Russia in circumstances where the threat of a nuclear response may not be credible and where suitable non-nuclear options may exist or may be developed. At the same time, we believe that major changes in the role of nuclear weapons in our strategies for the PRC and Russia will require verifiable reductions or constraints on their nuclear forces; otherwise the United States would assume unacceptable deterrence and assurance risks.

In a potential conflict with a competitor, the United States would need to be able to deter opportunistic aggression by another competitor. We will rely in part on nuclear weapons to help mitigate this risk, recognizing that a near-simultaneous conflict with two nuclear-armed states would constitute an extreme circumstance.

Our strategy for North Korea recognizes the threat posed by its nuclear, chemical, missile, and conventional capabilities, and in particular the need to make clear to the Kim regime the dire consequences should it use nuclear weapons. Any nuclear attack by North Korea against the United States or its Allies and partners is unacceptable and will result in the end of that regime. There is no scenario in which the Kim regime could employ nuclear weapons and survive. Short of nuclear use, North Korea can also conduct rapid strategic attacks in East Asia. United States nuclear weapons continue to play a role in deterring such attacks. Further, we will hold the regime responsible for any transfers it makes of nuclear weapons technology, material, or expertise to any state or non-state actor.

Iran does not currently pose a nuclear threat but continues to develop capabilities that would enable it to produce a nuclear weapon should it make the decision to do so. The United States relies on non-nuclear overmatch to deter regional aggression by Iran as long as Iran does not possess nuclear weapons. It is U.S. policy that Iran will not be allowed to obtain a nuclear weapon. This policy has been consistent across successive administrations since the public disclosure of a clandestine Iranian nuclear program.

Managing the Risks of Escalation and Miscalculation. Changes in the security environment and new capabilities – particularly in the cyber and space domains – will contribute in crisis or conflict to an increasingly complex operating environment. In this type of environment, deterring aggression and managing escalation will be more challenging. Accordingly, in developing and executing tailored deterrence strategies, we will follow guidelines for managing escalation risk. These guidelines will reflect general principles and approaches that favor crisis stability, such as architectural resilience and defenses that reduce first mover advantages in cyber and space; operational concepts and capabilities that provide options intended to limit escalation risk; and resilient, stress-tested weapon systems and command and control networks.

Additionally, in crisis or conflict we will seek to manage escalation risk by addressing adversary misperceptions that may exist regarding U.S. resolve, capabilities, strategic intentions, or war aims that could lead to miscalculation. This can be accomplished through the way we posture our nuclear and non-nuclear forces, public and private messaging, and crisis communication and management mechanisms. It is equally important, in building operational plans and making decisions regarding nuclear posture and readiness, to reduce the risk that the United States will misinterpret adversary intentions or capabilities, or unknowingly cross a misunderstood or ambiguous threshold for adversary nuclear use. Intelligence analysis, simulations and wargames, “red teaming,” and other means offer actionable insights to U.S. leaders that help mitigate this risk.

Peacetime dialogue with potential adversaries can facilitate efforts in a crisis or war to reduce risks of misperception that could lead to escalation. Our goals in discussions on strategic stability include improving transparency and mutual understanding of threat perceptions, policies, doctrine, and capabilities, as well as establishing or enhancing crisis management processes that can help avoid or limit conflict escalation. The United States has substantial experience in strategic dialogue and crisis management with Russia, but has made little progress with the PRC despite consistent U.S. efforts. The world expects nuclear powers to act responsibly, including on risk reduction and crisis communications, and the United States will continue to pursue these efforts with China.

We also recognize the risk of unintended nuclear escalation, which can result from accidental or unauthorized use of a nuclear weapon. The United States has extensive protections in place to mitigate this risk. As an example, U.S. intercontinental ballistic missiles (ICBMs) are not on “hair trigger” alert. These forces are on day-to-day alert, a posture that contributes to strategic stability. Forces on day-to-day alert are subject to multiple layers of control, and the United States maintains rigorous procedural and technical safeguards to prevent misinformed, accidental, or unauthorized launch. Survivable and redundant sensors provide high confidence that potential attacks will be detected and characterized, enabling policies and procedures that ensure a deliberative process allowing the President sufficient time to gather information and consider courses of action. In the most plausible scenarios that concern policy leaders today, there would be time for full deliberation. For these reasons, while the United States maintains the capability to launch nuclear forces under conditions of an ongoing nuclear attack, it does not rely on a launch-under-attack policy to ensure a credible response. Rather, U.S. nuclear forces are postured to withstand an initial attack. In all cases, the United States will maintain a human “in the loop” for all actions critical to informing and executing decisions by the President to initiate and terminate nuclear weapon employment.

As confidence- and security-building measures, the United States has taken steps over time to modify its nuclear posture to enhance stability. We continue to maintain our longstanding practice of open-ocean targeting of strategic nuclear forces day-to-day. Additionally, while we retain the capability to upload a portion of the ICBM force, we continue to configure these missiles with only one warhead day-to-day, thereby reducing adversary incentive to launch a first strike. Further “de-alerting” ICBMs or other steps to reduce alert levels could undermine crisis stability by heightening adversary incentives to attack or to increase nuclear readiness as a coercive measure.

DoD will continue working to gain a deeper understanding of potential risks to crisis stability. In addition, as directed by the National Defense Authorization Act for Fiscal Year 2022, DoD will commission an independent review of the safety, security, and reliability of U.S. nuclear weapons, NC3, and integrated tactical warning/attack assessment systems.

V. STRENGTHENING REGIONAL NUCLEAR DETERRENCE

As long as Allies and partners face nuclear threats, extended nuclear deterrence will remain a pillar of regional security architectures. Effective assurance of Allies and partners is built on a shared view of the security environment and deterrence challenges; a commitment to risk- and burden-sharing; modern and effective nuclear forces; robust consultation processes; and Ally and partner confidence that the United States has the will and capability to meet its security commitments. Based on these principles, we will collaborate with Allies and partners to tailor extended deterrence and assurance policies that are responsive to the security environment and that integrate our collective capabilities across all tools of national power.

Assurance also rests on a commitment to advance shared goals for arms control, non-proliferation, and other forms of risk reduction consistent with collective security interests. This includes identifying steps to reduce the risk of miscalculation that could lead to deliberate or inadvertent nuclear escalation.

Strong and Credible Nuclear Deterrence in the Euro-Atlantic Region. As long as nuclear weapons exist, NATO will remain a nuclear alliance. A strong, cohesive Alliance with a clear nuclear mission remains essential to deter aggression and promote peace and stability in the Euro-Atlantic area, especially in light of Russia's aggression against its neighbors and the central role nuclear weapons and other strategic capabilities play in Russian doctrine.

United States strategic nuclear forces and forward-deployed nuclear weapons provide an essential political and military link between Europe and North America. Combined with the independent nuclear forces of France and the United Kingdom and NATO's nuclear burden-sharing arrangements, U.S. nuclear forces remain essential to the Alliance's deterrence and defense posture. Since Russia's invasion of Ukraine and occupation of Crimea in 2014, NATO has taken steps to ensure a modern, ready, and credible NATO nuclear deterrent. This includes modernizing U.S. nuclear weapons forward-deployed in Europe and, with participating NATO Allies, transitioning to a new generation of fighter aircraft, including the U.S. F-35A Joint Strike Fighter. The United States will work with Allies concerned to ensure that the transition to modern DCA and the B61-12 bomb is executed efficiently and with minimal disruption to readiness.

Further steps are needed to fully adapt these forces to current and emerging security conditions. We will work with Allies and partners to monitor Russian capabilities and doctrine and other aspects of the threat environment; enhance the readiness, survivability and effectiveness of the DCA mission across the conflict spectrum, including through enhanced exercises; strengthen the coherence of NATO's nuclear and non-nuclear capabilities and concepts to ensure they are mutually supportive; and achieve the broadest possible participation in NATO's nuclear burden-sharing mission consistent with treaty commitments. Any changes in NATO's nuclear posture will be taken only after a thorough review within – and decision by – the Alliance.

Strong and Credible Nuclear Deterrence in the Indo-Pacific Region. Our security commitments to Allies and partners in the Indo-Pacific region are steadfast. We recognize growing concerns about nuclear and missile developments in the PRC, North Korea, and Russia, and are committed to strengthening deterrence in ways that are responsive to changes in the regional security environment. Toward that end, we will work with Allies and partners to ensure an effective mix of capabilities, concepts, deployments, exercises, and tailored options to deter and, if necessary, respond to coercion and aggression.

Foundational to this approach is stronger extended deterrence consultation emphasizing a cooperative approach between the United States and Allies in decision-making related to nuclear deterrence policy, strategic messaging, and activities that reinforce collective regional security. Building on the extended deterrence dialogues established over the last decade with the Republic of Korea (ROK), Japan and Australia, and other forums, we will identify pragmatic steps to enhance consultation. This could include periodically meeting at higher levels of seniority and examining options to improve crisis management consultation. An important goal is to identify opportunities for trilateral (United States, Japan, ROK) or quadrilateral (plus Australia) information sharing and dialogue. Relevant lessons-learned from dialogues and consultations should be directly factored into the development of tailored deterrence strategies and operational plans.

The United States will continue to field flexible nuclear forces suited to deterring regional nuclear conflict, including the capability to forward deploy strategic bombers, dual-capable fighter aircraft, and nuclear weapons to the region and globally. We will work with Allies and partners to identify opportunities to increase the visibility of U.S. strategic assets to the region as a demonstration of U.S. resolve and commitment, including ballistic missile submarine port visits and strategic bomber missions. Greater capability integration is an important goal, as well – to better synchronize the nuclear and non-nuclear elements of deterrence and to leverage Ally and partner non-nuclear capabilities that can support the nuclear deterrence mission. In advancing these goals, we view the expertise, capabilities, and resources of our Allies and partners as “force multipliers” for strengthening deterrence.

VI. ARMS CONTROL, NUCLEAR NON-PROLIFERATION, AND COUNTERTERRORISM

Beyond the critical role played by deterrence, arms control, risk reduction, and nuclear non-proliferation play indispensable roles in further reducing nuclear dangers. Together, these are mutually reinforcing tools for preserving stability, deterring aggression and escalation, and avoiding arms racing and nuclear war. We are placing renewed emphasis on arms control, nuclear nonproliferation, and risk reduction. These policies complement U.S. nuclear policy and force structure decisions and enable us to pursue opportunities to reduce the role of nuclear weapons globally, enhance strategic stability with the PRC and Russia, and reduce the risks of war or escalation during war. In particular, limitations on and greater transparency into adversary nuclear and possibly non-nuclear strategic capabilities through arms control is central to any approach to reduce the role of nuclear weapons. Mutual, verifiable nuclear arms control offers the most effective, durable and responsible path to reduce the role of nuclear weapons in our strategy and prevent their use. Consistent with our commitment to put diplomacy first, the United States will pursue new arms control arrangements that address the full range of nuclear threats and advance our global non-proliferation interests.

PRC and Russian actions to expand their nuclear arsenals make mutual and verifiable arms control challenging, but the United States will prepare for engagement and realistic outcomes in dialogues with both governments as this remains in our national security interest. We will seek opportunities to pursue practical steps to advance the goals of greater transparency and predictability, enhanced stability, reduced reliance on nuclear weapons and, ultimately, a world without nuclear weapons. Russia will remain a focus of U.S. efforts given the size, diversity, and continuing modernization of its nuclear arsenal. However, we will need to account for the PRC's nuclear expansion in future U.S.-Russia arms control discussions.

Nuclear Arms Control and Risk Reduction. Upon taking office in January 2021, the President immediately extended the New START Treaty for the full five-years provided in the Treaty. Extending verifiable limits on Russian intercontinental-range nuclear forces contributes to strategic stability and advances our defense priorities. We will continue to implement the Treaty and verify Russian compliance. Expiration of the Treaty without a follow-on agreement would leave Russia free to expand strategic nuclear forces that are now constrained, as well as novel intercontinental-range and regional systems that are not currently limited by the Treaty.

The United States is ready to expeditiously negotiate a new arms control framework to replace New START when it expires in 2026, although negotiation requires a willing partner operating in good faith. Our priorities include fostering transparency and mutual risk reduction, pursuing initiatives that limit destabilizing systems or postures, and reducing the chance of miscalculation. Although the United States and Russia have expressed support for extending nuclear arms control beyond the New START Treaty, our priorities are not identical, underscoring the importance of

dialogue, when conditions permit, to address each side's differing goals and perceptions of military systems that affect strategic stability.

The scope and pace of the PRC's nuclear expansion, as well as its lack of transparency and growing military assertiveness, raise questions regarding its intentions, nuclear strategy and doctrine, and perceptions of strategic stability. This underscores the need for discussions on practical steps to reduce strategic risks, including steps that could lay the groundwork for additional discussion of mutual restraints in capabilities and behavior. Although the PRC has been reluctant to discuss these items, the United States remains ready to engage the PRC on a full range of strategic issues, with a focus on military de-confliction, crisis communications, information sharing, mutual restraint, risk reduction, emerging technologies, and approaches to nuclear arms control, among other issues. The United States remains prepared to meet with the PRC in bilateral and multilateral fora while pressing for these discussions to include both sides' military and diplomatic authorities.

Engagement with the PRC should address its plans for expanding fissile material production to support its growing nuclear arsenal. The PRC should adopt a moratorium on fissile material production or, at a minimum, provide increased transparency to assure the international community that fissile material produced for civilian purposes is fully accounted for and not diverted to military uses. We will make clear to the international community our concerns regarding the PRC's growing nuclear arsenal, and ensure outreach to the PRC is consistent with our security commitments to allies and partners.

Successfully enforcing future arms control agreements will require new technical capabilities for verification and monitoring (V&M). The United States is already investing in some of the needed technologies, but additional resource prioritization may be required to ensure they will be available when needed. Our participation in several international collaborations (e.g., International Partnership for Nuclear Disarmament Verification) advances the technical basis for innovation in V&M. To support our long-term arms control, non-proliferation, and disarmament goals, we are committed to developing the next generation of policy and technical experts needed to negotiate and implement future agreements.

Nuclear Non-Proliferation. The United States remains dedicated to preserving and strengthening the nuclear non-proliferation regime and reaffirms its commitment to the NPT. The NPT has made the world safer and more prosperous, and all Parties, including the United States and its Allies and partners, continue to benefit from the Treaty. The International Atomic Energy Agency (IAEA) and its nuclear safeguards system, including the Additional Protocol, as well as effective international export controls, impede nuclear proliferation and should be strengthened. U.S. actions to "pursue negotiations in good faith on effective measures relating to nuclear disarmament" advance U.S. national security in their own right but also build international confidence in the broader benefits of the nuclear non-proliferation regime. The United States will continue to pursue political and technological barriers to nuclear proliferation, including through strengthened strategic trade controls and support for the adoption of nuclear weapon-free zones.

We will also continue to support efforts that enable all NPT States Parties to enjoy the benefits of peaceful nuclear technology.

U.S. policy is to prevent Iran from obtaining a nuclear weapon, and is pursuing principled diplomacy in coordination with Allies and partners to constrain Iran's nuclear activities. Further, we support measures to limit Iranian nuclear activities applicable to a nuclear weapons program and to provide the greatest possible level of international transparency and verification.

Our policy toward North Korea calls for a calibrated diplomatic approach to secure practical progress that increases the security of the United States, our Allies and partners, and deployed forces. At the same time, we will continue to press North Korea to comply with its obligations under various United Nations Security Council resolutions and return to negotiations to verifiably eliminate its nuclear program. With respect to reducing or eliminating the threat from North Korea, our goal remains the complete and verifiable denuclearization of the Korean Peninsula.

Multilateral Arms Control and Disarmament. The P5 Process promotes dialogue on nuclear issues that could build confidence and understanding, enhance transparency, and create a forum for high-level engagement. Future efforts could be tailored to deepen engagement on nuclear doctrines, concepts for strategic risk reduction, and nuclear arms control verification.

The United States supports the Comprehensive Nuclear-Test-Ban Treaty (CTBT) and is committed to working to achieve its entry into force, recognizing the significant challenges that lie ahead in reaching this goal. In the near term, we continue to support the Preparatory Commission for the CTBT Organization; the completion and provisional operation of the International Monitoring System and International Data Centre; and development of the on-site inspection regime so that it will be capable of carrying out its compliance verification mission once the Treaty enters into force.

Once in force, the CTBT would ban nuclear explosive tests of any yield. Under the CTBT there is no threshold of nuclear yield below which nuclear explosive tests are permissible. If the CTBT were to enter into force, Russia and the PRC would have an obligation to comply with the Treaty's "zero-yield" standard. The United States will engage with Russia and the PRC, as appropriate, in order to address nuclear test site activities of concern relative to the Treaty, as outlined in the Department of State's Compliance Report. Those concerns do not outweigh the security benefits of the Treaty; indeed, the Treaty's benefits would include a legally binding basis and tools for challenging that behavior. Consistent with the goals of the CTBT, the United States continues to observe a moratorium on nuclear explosive testing and calls on all states possessing nuclear weapons to declare or maintain such a moratorium. The Department of Energy's National Nuclear Security Administration (NNSA) stockpile stewardship program enables the United States to ensure a safe, secure, and effective nuclear deterrent without requiring a return to nuclear explosive testing. This helps advance U.S. non-proliferation objectives and sets a responsible example for all nuclear weapons states

A Fissile Material Cutoff Treaty (FMCT) would ban the production of fissile material for use in nuclear weapons and remains a key element of the global non-proliferation and disarmament agenda. The United States continues to support the commencement of FMCT negotiations, provided they are governed by consensus and all key states participate. In the interim, we remain committed to maintaining our unilateral moratorium on the production of fissile material for use in nuclear weapons, which has been in place since the early 1990s. We continue to encourage all states that have not yet done so, including the PRC, to declare and maintain such a moratorium immediately.

While the United States actively pursues the goal of a world without nuclear weapons, it does not consider the Treaty on the Prohibition of Nuclear Weapons (TPNW) to be an effective means to reach that goal. The United States does not share the underlying assumption of the TPNW that the elimination of nuclear weapons can be achieved irrespective of the prevailing international security environment. Nor do we consider the TPNW to be an effective tool to resolve the underlying security conflicts that lead states to retain or seek nuclear weapons.

Nuclear Counterterrorism. Preventing an act of nuclear terrorism is an enduring national security requirement. We will continue to work through diplomacy and partnerships to advance the core elements of our nuclear counterterrorism strategy: denying non-state actors access to nuclear materials and related technology; improving forensic capabilities to identify the origin of nuclear material outside of regulatory control or used in a nuclear device; monitoring and disrupting terrorist attempts to obtain nuclear capabilities; and, maintaining an incident response posture to detect, interdict, and defeat nuclear threats or minimize the consequence of nuclear events.

This strategy contributes to the deterrence of both non-state actors and hostile states that might contemplate providing nuclear material or other assistance to would-be nuclear terrorists, and provides for response options should deterrence fail. Deterring states from facilitating acts of nuclear terrorism by others is enabled in part by nuclear forensic capabilities that provide the scientific basis to hold such states accountable. Greater investment in these technical nuclear forensic tools is required to ensure they remain responsive to the threat, and thus scientifically credible and internationally accepted.

VII. U.S. NUCLEAR CAPABILITIES

The United States will field and maintain strategic nuclear delivery systems and deployed weapons in compliance with New START Treaty central limits as long as the Treaty remains in force. We will continue to deploy a nuclear triad and are fully committed to the programs that will begin to field modernized systems later this decade. Programs are also being executed to modernize U.S. DCA, the nuclear weapons stockpile, the NC3 architecture, and the weapons production infrastructure.

The three legs of the nuclear Triad are complementary, with each component offering unique attributes. Maintaining a modern triad possessing these attributes – effectiveness, responsiveness, survivability, flexibility, and visibility – ensures that the United States can withstand and respond to any strategic attack, tailor its deterrence strategies as needed, and assure Allies in support of our extended deterrence commitments.

While the U.S. nuclear arsenal remains safe, secure, and effective, most nuclear deterrent systems are operating beyond their original design life. Replacement programs are on track at this time, but there is little or no margin between the end of effective life of existing systems and the fielding of their replacements. These replacement programs are planned to deliver modernized capabilities to avoid any gaps in our ability to field a credible and effective deterrent.

The B83-1 gravity bomb will be retired due to increasing limitations on its capabilities and rising maintenance costs. In the near-term, we will leverage existing capabilities to hold at risk hard and deeply buried targets. DoD, working with its interagency partners and informed by existing concepts, will develop an enduring capability for improved defeat of such targets.

In addition, we are cancelling the nuclear-armed Sea-Launched Cruise Missile (SLCM-N) program. The 2018 NPR introduced SLCM-N and the W76-2 to supplement the existing nuclear program of record in order to strengthen deterrence of limited nuclear use in a regional conflict. We reassessed the rationale for these capabilities and concluded that the W76-2 currently provides an important means to deter limited nuclear use. Its deterrence value will be re-evaluated as the F-35A and LRSO are fielded, and in light of the security environment and plausible deterrence scenarios we could face in the future. We concluded SLCM-N was no longer necessary given the deterrence contribution of the W76-2, uncertainty regarding whether SLCM-N on its own would provide leverage to negotiate arms control limits on Russia's NSNW, and the estimated cost of SLCM-N in light of other nuclear modernization programs and defense priorities.

2022 NUCLEAR POSTURE REVIEW PROGRAMMATIC FINDINGS

LAND-BASED FORCE

- Fully fund the Sentinel ICBM replacement program of record in the 2023 – 2027 Future Years Defense Program.
- Sentinel will replace Minuteman III (MMIII) one-for-one to maintain 400 ICBMs on alert.
- Sentinel will field the W87-0/Mk21 and W87-1/Mk21A warheads and aeroshells.
- Any alternative to the Sentinel program of record that extends MMIII life and replaces it in the future would increase risk and cost.

SEA-BASED FORCE

- Fully fund the COLUMBIA-Class SSBN program to deliver a minimum of 12 boats to replace the OHIO-Class fleet beginning in 2030.
- Prioritize near-term investments in the submarine construction industrial base and OHIO-Class sustainment until the completion of the COLUMBIA-Class transition.
- Prioritize near-term investment in the Trident II D5 Strategic Weapon System second life extension. Complete the W88 Alt 370 program, which does not introduce new military capability.
- Continue the W93 warhead program. Continue to support the United Kingdom with its Replacement Warhead Program, Common Missile Compartment, and Mk7 aeroshell.

AIR-BASED FORCE

- Modernize the B-52H Stratofortress bomber fleet through 2050 as a nuclear standoff platform with global reach.
- Fully fund the B-21 Raider bomber to replace the B-2A Spirit fleet. The Air Force will acquire a minimum of 100 B-21 aircraft.
- Fully fund the Long-Range Standoff weapon and associated W80-4 warhead to replace the Air-Launched Cruise Missile.
- Retire the B83-1 gravity bomb. Leverage existing capabilities in the near-term and develop an enduring capability for improved defeat of Hard and Deeply Buried Targets.

SUPPLEMENTAL AND DCA CAPABILITIES

- Retain the W76-2 low-yield Submarine-Launched Ballistic Missile option and periodically reassess its deterrent value.
- Cancel the nuclear-armed Sea-Launched Cruise Missile program.
- Continue nuclear certification of the F-35A fighter aircraft and transition from the F-15E to the F-35A to support NATO's nuclear mission.
- Replace B61-3/4/7 nuclear gravity bombs with the life-extended B61-12.

Strengthening Nuclear Command, Control, and Communications (NC3). Our NC3 system must provide command and control of U.S. nuclear forces at all times and under all circumstances, including during and following a nuclear or non-nuclear attack by any adversary. Resilient NC3 capabilities are a critical enabler of mission assurance for nuclear operations. The five essential functions for nuclear command and control are detection, warning and attack characterization; adaptive nuclear planning; decision-making conferencing; receiving and executing Presidential orders; and enabling the management and direction of forces.

We will employ an optimized mix of resilience approaches to protect the next-generation NC3 architecture from threats posed by competitor capabilities. This includes, but is not limited to, enhanced protection from cyber, space-based, and electro-magnetic pulse threats; enhanced integrated tactical warning and attack assessment; improved command post and communication links; advanced decision support technology; and integrated planning and operations.

Technology Innovation for the Nuclear Enterprise. A stronger and more systematic approach to technology innovation is key to building enduring advantage in the nuclear enterprise. This requires investing in new research, prototyping, and engineering efforts that can be leveraged as needed to ensure a safe, secure, and effective nuclear deterrent into the future. The nuclear enterprise will increase focus on research, development, test, and evaluation efforts; government purpose data rights; and faster development of technologies and system concepts through digital engineering and open architecture designs, for example. Development activities will emphasize a robust experimental approach to the use of emerging technologies and innovative design practices to promote competition of concepts, accelerate technology readiness, bolster the critical workforce, and help leadership understand technology opportunities. This multi-faceted approach will promote technology-based resilience and will reduce the risks associated with developing or adapting future nuclear deterrent capabilities.

Stockpile Certification. Since 1992, the United States has maintained a moratorium on nuclear explosive testing and remains committed to assuring the safety, security and reliability of our arsenal through a rigorous science-based stockpile stewardship program. For more than twenty years, the Secretaries of Defense and Energy, the directors of the national security laboratories, and the Commanders of U.S. Strategic Command (USSTRATCOM) have annually assessed that our nuclear stockpile is safe, reliable, and effective, and that there is no current need to conduct nuclear explosive tests to ensure stockpile reliability. As nuclear warhead system lifetimes are extended, the NNSA and USSTRATCOM required assessments and certifications of warhead systems are increasingly challenged by limited surveillance hardware and testing opportunities. Additionally, if any issues are observed through surveillance activities and tests, the capacity of the production infrastructure to make necessary changes can interrupt other planned modernization programs. Therefore, the United States maintains a nuclear explosive test readiness program in the event it is required to resolve technical uncertainties. The United States does not envision or desire a return to nuclear explosive testing. Any resumption of nuclear testing would occur only at the President's explicit direction.

VIII. A RESILIENT AND ADAPTIVE NUCLEAR SECURITY ENTERPRISE

For most of the post-Cold War period, the focus of our nuclear security enterprise has been to sustain existing nuclear weapons and improve our ability to assess their safety, security, reliability, and effectiveness without nuclear explosive testing. When aging issues were identified in the stockpile, weapons were partially refurbished without changing their military characteristics, and safety and security systems were sometimes upgraded. Elements of the production infrastructure were dismantled and other elements were not sustained.

Today, much of the stockpile has aged without comprehensive refurbishment. At a time of rising nuclear risks, a partial refurbishment strategy no longer serves our interests. A safe, secure, and effective deterrent requires modern weapons and a modern infrastructure, enabled by a world-class workforce equipped with modern tools. We must develop and field a balanced, flexible stockpile capable of pacing threats, responding to uncertainty, and maintaining effectiveness. To accomplish this, we must re-establish, repair, and modernize our production infrastructure, and ensure it has appropriate capabilities and sufficient capacity to build and maintain modern nuclear weapons in a timely manner. The nuclear security enterprise must be able to respond in a timely way to threat developments and technology opportunities, maintain effectiveness over time, and at all times ensure that Presidential guidance can be achieved.

This plan has three pillars. First, given the complexity and interconnected nature of ongoing nuclear modernization and sustainment programs, DoD and NNSA will improve coordination and integration. DoD and NNSA will develop and implement a *Nuclear Deterrent Risk Management Strategy* to identify, prioritize, and recommend actions across the portfolio of nuclear programs and monitor the overall health of the nuclear deterrent as we sustain current capabilities and transition to modernized systems. This strategy will be informed by ongoing assessment of the security environment and early identification of potential risks, with the goal of enhancing senior leader visibility and framing options for risk mitigation.

Second, NNSA will institute a *Production-based Resilience Program* (PRP) to complement the science-based stewardship program and ensure that the nuclear security enterprise is capable of full-scope production. The PRP will establish the capabilities and infrastructure that can efficiently produce weapons required in the near-term and beyond, and that are sufficiently resilient to adapt to additional or new requirements should geopolitical or technology developments warrant. Key attributes are flexibility, supply chain security and resilience, production capacity margin, and elimination of single point failures. The PRP will enable more regular and timely incorporation of advanced technologies to improve safety, security, and reliability; accommodate arms control considerations as design features as weapons and infrastructure are modernized; and enable improved stockpile management and risk mitigation without overreliance on single warhead types, a large reserve stockpile, or increases to the size of the stockpile.

The PRP will address all elements of the enterprise including production of primaries, secondaries, tritium, and non-nuclear components; domestic uranium enrichment; and system assembly and disassembly. For primary production, the highest priority for the next ten years is pit production, a capability lost when the Rocky Flats facility was closed in 1992. Restoring the ability to produce plutonium pits for primaries will guard against the uncertainties of plutonium aging in today's stockpile and will also allow new pit designs to be manufactured if necessary for future weapons. The two-site strategy at Los Alamos National Laboratory and the Savannah River Site will eliminate single point failure and provide flexible capacity options. Priorities for secondary production are completion and full operation of the Uranium Processing Facility, as well as depleted uranium and lithium facilities modernization. Modernizing tritium production will assure a reliable and resilient domestic source and options for longer stockpile life tritium components. Modernizing development and production capabilities of high explosives and energetic materials will eliminate single points of failure. Modernizing production capacity for non-nuclear components encompasses items such as strategic radiation-hardened microelectronics, component test capabilities, and sufficient manufacturing floor space.

Third, NNSA will establish a *Science and Technology Innovation Initiative* to accelerate the integration of science and technology (S&T) throughout its activities. This initiative will add to the existing science portfolio an increased focus on leveraging S&T to support the weapon design and production phases and modernize the production complex. The goal is to more rapidly assimilate findings from academic, commercial, and internal research and thereby reduce the time and cost required to design and produce weapons with the most modern technologies that are most responsive to potential threats. This initiative will include new and replacement science facilities. Additionally, NNSA will partner closely with DoD's S&T community as both pursue activities to foster and exercise the national technology base.

The health of the enterprise depends critically on recruiting and retaining a skilled and diverse workforce. We will place priority on programs and policies to ensure the nuclear security enterprise can attract and retain talent and conduct effective knowledge transfer. Building a resilient and adaptive enterprise will take time. There is no quick fix, but with sustained national commitment, a sound strategy, and a 21st century workforce, we will maintain a safe, secure, and effective nuclear deterrent for as long as necessary.

IX. CONCLUSION

In an increasingly complex security environment, we are committed to ensuring a safe, secure, and effective nuclear deterrent, and strong and credible extended deterrence – a posture that contributes to stability and supports the broader objectives of our National Defense Strategy. This includes a commitment to responsible stewardship of our nuclear weapons, constructive collaboration with our Allies and partners, pragmatic approaches to arms control and non-proliferation, and responsible technology innovation that enhances stability. We fully recognize the enduring importance of a nuclear policy that balances the evolving demands of deterrence with our goal of taking steps to reduce the role of nuclear weapons in our national security strategy, and thereby reducing the salience of nuclear weapons globally. We will work with a sense of urgency to reduce the danger of nuclear war, which would have catastrophic consequences for the United States and the world. Developments in the security environment make these goals both more challenging and more pressing to pursue. However, we can only make progress in these respects if we are confident in the ability of our nuclear posture to deter aggression and protect our Allies and partners. Thus, for the foreseeable future, nuclear weapons will continue to provide unique deterrence effects that no other element of U.S. military power can replace. To deter aggression and preserve our security in the current security environment, we will maintain a nuclear posture that is responsive to the threats we face.

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