



NUCLEAR POSTURE REVIEW REPORT

APRIL 2010



NPR

EXECUTIVE SUMMARY

In his April 2009 speech in Prague, President Obama highlighted 21st century nuclear dangers, declaring that to overcome these grave and growing threats, the United States will “seek the peace and security of a world without nuclear weapons.” He recognized that such an ambitious goal could not be reached quickly – perhaps, he said, not in his lifetime. But the President expressed his determination to take concrete steps toward that goal, including by reducing the number of nuclear weapons and their role in U.S. national security strategy. At the same time, he pledged that as long as nuclear weapons exist, the United States will maintain a safe, secure, and effective arsenal, both to deter potential adversaries and to assure U.S. allies and other security partners that they can count on America’s security commitments.



President Barack Obama unveils his vision for reducing nuclear dangers and pursuing the long-term goal of a world without nuclear weapons in Prague’s Hradcany Square on Apr. 5, 2009. Official White House photo by Lawrence Jackson.

The 2010 Nuclear Posture Review (NPR) outlines the Administration’s approach to promoting the President’s agenda for reducing nuclear dangers and pursuing the goal of a world without nuclear weapons, while simultaneously advancing broader U.S. security interests. The NPR reflects the President’s national security priorities and the supporting defense strategy objectives identified in the 2010 Quadrennial Defense Review.

After describing fundamental changes in the international security environment, the NPR report focuses on five key objectives of our nuclear weapons policies and posture:

1. Preventing nuclear proliferation and nuclear terrorism;
2. Reducing the role of U.S. nuclear weapons in U.S. national security strategy;
3. Maintaining strategic deterrence and stability at reduced nuclear force levels;
4. Strengthening regional deterrence and reassuring U.S. allies and partners; and
5. Sustaining a safe, secure, and effective nuclear arsenal.

While the NPR focused principally on steps to be taken in the next five to ten years, it also considered the path ahead for U.S. nuclear strategy and posture over the longer term. Making sustained progress to reduce nuclear dangers, while ensuring security for ourselves and our allies and partners, will require a concerted effort by a long succession of U.S. Administrations and Congresses. Forging a sustainable consensus on the way ahead is critical.

The Changed – and Changing – International Security Environment

The international security environment has changed dramatically since the end of the Cold War. The threat of global nuclear war has become remote, but the risk of nuclear attack has increased.

As President Obama has made clear, today's most immediate and extreme danger is nuclear terrorism. Al Qaeda and their extremist allies are seeking nuclear weapons. We must assume they would use such weapons if they managed to obtain them. The vulnerability to theft or seizure of vast stocks of such nuclear materials around the world, and the availability of sensitive equipment and technologies in the nuclear black market, create a serious risk that terrorists may acquire what they need to build a nuclear weapon.

Today's other pressing threat is nuclear proliferation. Additional countries – especially those at odds with the United States, its allies and partners, and the broader international community – may acquire nuclear weapons. In pursuit of their nuclear ambitions, North Korea and Iran have violated non-proliferation obligations, defied directives of the United Nations Security Council, pursued missile delivery capabilities, and resisted international efforts to resolve through diplomatic means the crises they have created. Their provocative behavior has increased instability in their regions and could generate pressures in neighboring countries for considering nuclear deterrent options of their own. Continued non-compliance with non-proliferation norms by these and other countries would seriously weaken the Nuclear Non-Proliferation Treaty (NPT), with adverse security implications for the United States and the international community.

While facing the increasingly urgent threats of nuclear terrorism and nuclear proliferation, the United States must continue to address the more familiar challenge of ensuring strategic stability with existing nuclear powers – most notably Russia and China. Russia remains America's only peer in the area of nuclear weapons capabilities. But the nature of the U.S.-Russia relationship has changed fundamentally since the days of the Cold War. While policy differences continue to arise between the two countries and Russia continues to modernize its still-formidable nuclear forces, Russia and the United States are no longer adversaries, and prospects for military confrontation have declined dramatically. The two have increased their cooperation in areas of shared interest, including preventing nuclear terrorism and nuclear proliferation.

The United States and China are increasingly interdependent and their shared responsibilities for addressing global security threats, such as weapons of mass destruction (WMD) proliferation and terrorism, are growing. At the same time, the United States and China's Asian neighbors remain concerned about China's current military modernization efforts, including its qualitative and quantitative modernization of its nuclear arsenal. China's nuclear arsenal remains much smaller than the arsenals of Russia and the United States. But the lack of transparency surrounding its nuclear programs – their pace and scope, as well as the strategy and doctrine that guides them – raises questions about China's future strategic intentions.

These changes in the nuclear threat environment have altered the hierarchy of our nuclear concerns and strategic objectives. In coming years, we must give top priority to discouraging additional countries from acquiring nuclear weapons capabilities and stopping terrorist groups from acquiring nuclear bombs or the materials to build them. At the same time, we must continue to maintain stable strategic relationships with Russia and China and counter threats posed by any emerging nuclear-armed states, thereby protecting the United States and our allies and partners against nuclear threats or intimidation, and reducing any incentives they might have to seek their own nuclear deterrents.

Implications for U.S. Nuclear Weapons Policies and Force Posture

The massive nuclear arsenal we inherited from the Cold War era of bipolar military confrontation is poorly suited to address the challenges posed by suicidal terrorists and unfriendly regimes seeking nuclear weapons. Therefore, it is essential that we better align our nuclear policies and posture to our most urgent priorities – preventing nuclear terrorism and nuclear proliferation.

This does not mean that our nuclear deterrent has become irrelevant. Indeed, as long as nuclear weapons exist, the United States will sustain safe, secure, and effective nuclear forces. These nuclear forces will continue to play an essential role in deterring potential adversaries and reassuring allies and partners around the world.

But fundamental changes in the international security environment in recent years – including the growth of unrivaled U.S. conventional military capabilities, major improvements in missile defenses, and the easing of Cold War rivalries – enable us to fulfill those objectives at significantly lower nuclear force levels and with reduced reliance on nuclear weapons. Therefore, without jeopardizing our traditional deterrence and reassurance goals, we are now able to shape our nuclear weapons policies and force structure in ways that will better enable us to meet our most pressing security challenges.

- By reducing the role and numbers of U.S. nuclear weapons – meeting our NPT Article VI obligation to make progress toward nuclear disarmament – we can put ourselves in a

much stronger position to persuade our NPT partners to join with us in adopting the measures needed to reinvigorate the non-proliferation regime and secure nuclear materials worldwide.

- By maintaining a credible nuclear deterrent and reinforcing regional security architectures with missile defenses and other conventional military capabilities, we can reassure our non-nuclear allies and partners worldwide of our security commitments to them and confirm that they do not need nuclear weapons capabilities of their own.
- By pursuing a sound Stockpile Management Program for extending the life of U.S. nuclear weapons, we can ensure a safe, secure, and effective deterrent without the development of new nuclear warheads or further nuclear testing.
- By modernizing our aging nuclear facilities and investing in human capital, we can substantially reduce the number of nuclear weapons we retain as a hedge against technical or geopolitical surprise, accelerate dismantlement of retired warheads, and improve our understanding of foreign nuclear weapons activities.
- By promoting strategic stability with Russia and China and improving transparency and mutual confidence, we can help create the conditions for moving toward a world without nuclear weapons and build a stronger basis for addressing nuclear proliferation and nuclear terrorism.
- By working to reduce the salience of nuclear weapons in international affairs and moving step-by-step toward eliminating them, we can reverse the growing expectation that we are destined to live in a world with more nuclear-armed states, and decrease incentives for additional countries to hedge against an uncertain future by pursuing nuclear options of their own.

Preventing Nuclear Proliferation and Nuclear Terrorism

As a critical element of our effort to move toward a world free of nuclear weapons, the United States will lead expanded international efforts to rebuild and strengthen the global nuclear non-proliferation regime – and for the first time, the 2010 NPR places this priority atop the U.S. nuclear agenda. Concerns have grown in recent years that we are approaching a nuclear tipping point – that unless today’s dangerous trends are arrested and reversed, before very long we will be living in a world with a steadily growing number of nuclear-armed states and an increasing likelihood of terrorists getting their hands on nuclear weapons.

The U.S. approach to preventing nuclear proliferation and nuclear terrorism includes three key elements. First, we seek to bolster the nuclear non-proliferation regime and its centerpiece, the NPT, by reversing the nuclear ambitions of North Korea and Iran, strengthening International

Atomic Energy Agency safeguards and enforcing compliance with them, impeding illicit nuclear trade, and promoting the peaceful uses of nuclear energy without increasing proliferation risks. Second, we are accelerating efforts to implement President Obama's initiative to secure all vulnerable nuclear materials worldwide in four years.

And third, we are pursuing arms control efforts – including the New Strategic Arms Reduction Treaty (New START), ratification and entry into force of the Comprehensive Nuclear Test Ban Treaty, and negotiation of a verifiable Fissile Material Cutoff Treaty – as a means of strengthening our ability to mobilize broad international support for the measures needed to reinforce the non-proliferation regime and secure nuclear materials worldwide.

Among key Administration initiatives are:

- Pursuing aggressively the President's Prague initiative to secure all vulnerable nuclear materials worldwide, including accelerating the Global Threat Reduction Initiative and the International Nuclear Material Protection and Cooperation Program. This includes increasing funding in fiscal year (FY) 2011 for Department of Energy nuclear non-proliferation programs to \$2.7 billion, more than 25 percent.
- Enhancing national and international capabilities to disrupt illicit proliferation networks and interdict smuggled nuclear materials, and continuing to expand our nuclear forensics efforts to improve the ability to identify the source of nuclear material used or intended for use in a terrorist nuclear explosive device.
- Initiating a comprehensive national research and development program to support continued progress toward a world free of nuclear weapons, including expanded work on verification technologies and the development of transparency measures.
- Renewing the U.S. commitment to hold fully accountable any state, terrorist group, or other non-state actor that supports or enables terrorist efforts to obtain or use weapons of mass destruction, whether by facilitating, financing, or providing expertise or safe haven for such efforts.

Reducing the Role of U.S. Nuclear Weapons

The role of nuclear weapons in U.S. national security and U.S. military strategy has been reduced significantly in recent decades, but further steps can and should be taken at this time.

The fundamental role of U.S. nuclear weapons, which will continue as long as nuclear weapons exist, is to deter nuclear attack on the United States, our allies, and partners.

During the Cold War, the United States reserved the right to use nuclear weapons in response to a massive conventional attack by the Soviet Union and its Warsaw Pact allies. Moreover, after the

United States gave up its own chemical and biological weapons (CBW) pursuant to international treaties (while some states continue to possess or pursue them), it reserved the right to employ nuclear weapons to deter CBW attack on the United States and its allies and partners.

Since the end of the Cold War, the strategic situation has changed in fundamental ways. With the advent of U.S. conventional military preeminence and continued improvements in U.S. missile defenses and capabilities to counter and mitigate the effects of CBW, the role of U.S. nuclear weapons in deterring non-nuclear attacks – conventional, biological, or chemical – has declined significantly. The United States will continue to reduce the role of nuclear weapons in deterring non-nuclear attacks.

To that end, the United States is now prepared to strengthen its long-standing “negative security assurance” by declaring that the United States will not use or threaten to use nuclear weapons against non-nuclear weapons states that are party to the NPT and in compliance with their nuclear non-proliferation obligations.

This revised assurance is intended to underscore the security benefits of adhering to and fully complying with the NPT and persuade non-nuclear weapon states party to the Treaty to work with the United States and other interested parties to adopt effective measures to strengthen the non-proliferation regime.

In making this strengthened assurance, the United States affirms that any state eligible for the assurance that uses chemical or biological weapons against the United States or its allies and partners would face the prospect of a devastating conventional military response – and that any individuals responsible for the attack, whether national leaders or military commanders, would be held fully accountable. Given the catastrophic potential of biological weapons and the rapid pace of bio-technology development, the United States reserves the right to make any adjustment in the assurance that may be warranted by the evolution and proliferation of the biological weapons threat and U.S. capacities to counter that threat.

In the case of countries not covered by this assurance – states that possess nuclear weapons and states not in compliance with their nuclear non-proliferation obligations – there remains a narrow range of contingencies in which U.S. nuclear weapons may still play a role in deterring a conventional or CBW attack against the United States or its allies and partners. The United States is therefore not prepared at the present time to adopt a universal policy that deterring nuclear attack is the sole purpose of nuclear weapons, but will work to establish conditions under which such a policy could be safely adopted.

Yet that does not mean that our willingness to use nuclear weapons against countries not covered by the new assurance has in any way increased. Indeed, the United States wishes to stress that it 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. It is in the U.S. interest and that of all other nations that the nearly 65-year record of nuclear non-use be extended forever.

Accordingly, among the key conclusions of the NPR:

- The United States will continue to strengthen conventional capabilities and reduce the role of nuclear weapons in deterring non-nuclear attacks, with the objective of making deterrence of nuclear attack on the United States or our allies and partners the sole purpose of U.S. nuclear weapons.
- 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 weapons states that are party to the NPT and in compliance with their nuclear non-proliferation obligations.

Maintaining Strategic Deterrence and Stability at Reduced Nuclear Force Levels

Since the end of the Cold War, the United States and Russia have reduced operationally deployed strategic nuclear weapons by about 75 percent, but both still retain many more nuclear weapons than they need for deterrence. The Administration is committed to working with Russia to preserve stability at significantly reduced force levels.

New START. The next step in this process is to replace the now-expired 1991 START I Treaty with another verifiable agreement, New START. An early task for the NPR was to develop U.S. positions for the New START negotiations and to consider how U.S. forces could be structured in light of the reductions required by the new agreement. The NPR reached the following conclusions:

- Stable deterrence can be maintained while reducing U.S. strategic delivery vehicles – intercontinental ballistic missiles (ICBMs), submarine-launched ballistic missiles (SLBMs), and nuclear-capable heavy bombers – by approximately 50 percent from the START I level, and reducing accountable strategic warheads by approximately 30 percent from the Moscow Treaty level.
- Building on NPR analysis, the United States agreed with Russia to New START limits of 1,550 accountable strategic warheads, 700 deployed strategic delivery vehicles, and a combined limit of 800 deployed and non-deployed strategic launchers.
- The U.S. nuclear Triad of ICBMs, SLBMs, and nuclear-capable heavy bombers will be maintained under New START.
- All U.S. ICBMs will be “de-MIRVed” to a single warhead each to increase stability.

- Contributions by non-nuclear systems to U.S. regional deterrence and reassurance goals will be preserved by avoiding limitations on missile defenses and preserving options for using heavy bombers and long-range missile systems in conventional roles.

Maximizing Presidential decision time. The NPR concluded that the current alert posture of U.S. strategic forces – with heavy bombers off full-time alert, nearly all ICBMs on alert, and a significant number of SSBNs at sea at any given time – should be maintained for the present. It also concluded that efforts should continue to diminish further the possibility of nuclear launches resulting from accidents, unauthorized actions, or misperceptions and to maximize the time available to the President to consider whether to authorize the use of nuclear weapons. Key steps include:

- Continuing the practice of “open-ocean targeting” of all ICBMs and SLBMs so that, in the highly unlikely event of an unauthorized or accidental launch, the missile would land in the open ocean, and asking Russia to re-confirm its commitment to this practice.
- Further strengthening the U.S. command and control system to maximize Presidential decision time in a nuclear crisis.
- Exploring new modes of ICBM basing that enhance survivability and further reduce any incentives for prompt launch.

Reinforcing strategic stability. Given that Russia and China are currently modernizing their nuclear capabilities – and that both are claiming U.S. missile defense and conventionally-armed missile programs are destabilizing – maintaining strategic stability with the two countries will be an important challenge in the years ahead.

- The United States will pursue high-level, bilateral dialogues on strategic stability with both Russia and China which are aimed at fostering more stable, resilient, and transparent strategic relationships.

A strategic dialogue with Russia will allow the United States to explain that our missile defenses and any future U.S. conventionally-armed long-range ballistic missile systems are designed to address newly emerging regional threats, and are not intended to affect the strategic balance with Russia. For its part, Russia could explain its modernization programs, clarify its current military doctrine (especially the extent to which it places importance on nuclear weapons), and discuss steps it could take to allay concerns in the West about its non-strategic nuclear arsenal, such as further consolidating its non-strategic systems in a small number of secure facilities deep within Russia.

With China, the purpose of a dialogue on strategic stability is to provide a venue and mechanism for each side to communicate its views about the other’s strategies, policies, and programs on

nuclear weapons and other strategic capabilities. The goal of such a dialogue is to enhance confidence, improve transparency, and reduce mistrust. As stated in the 2010 Ballistic Missile Defense Review Report, “maintaining strategic stability in the U.S.-China relationship is as important to this Administration as maintaining strategic stability with other major powers.”

Future nuclear reductions. The President has directed a review of post-New START arms control objectives, to consider future reductions in nuclear weapons. Several factors will influence the magnitude and pace of future reductions in U.S. nuclear forces below New START levels.

First, any future nuclear reductions must continue to strengthen deterrence of potential regional adversaries, strategic stability vis-à-vis Russia and China, and assurance of our allies and partners. This will require an updated assessment of deterrence requirements; further improvements in U.S., allied, and partner non-nuclear capabilities; focused reductions in strategic and non-strategic weapons; and close consultations with allies and partners. The United States will continue to ensure that, in the calculations of any potential opponent, the perceived gains of attacking the United States or its allies and partners would be far outweighed by the unacceptable costs of the response.

Second, implementation of the Stockpile Stewardship Program and the nuclear infrastructure investments recommended in the NPR will allow the United States to shift away from retaining large numbers of non-deployed warheads as a hedge against technical or geopolitical surprise, allowing major reductions in the nuclear stockpile. These investments are essential to facilitating reductions while sustaining deterrence under New START and beyond.

Third, Russia’s nuclear force will remain a significant factor in determining how much and how fast we are prepared to reduce U.S. forces. Because of our improved relations, the need for strict numerical parity between the two countries is no longer as compelling as it was during the Cold War. But large disparities in nuclear capabilities could raise concerns on both sides and among U.S. allies and partners, and may not be conducive to maintaining a stable, long-term strategic relationship, especially as nuclear forces are significantly reduced. Therefore, we will place importance on Russia joining us as we move to lower levels.

Key NPR recommendations include:

- Conduct follow-on analysis to set goals for future nuclear reductions below the levels expected in New START, while strengthening deterrence of potential regional adversaries, strategic stability vis-à-vis Russia and China, and assurance of our allies and partners.
- Address non-strategic nuclear weapons, together with the non-deployed nuclear weapons of both sides, in any post-New START negotiations with Russia.

- Implement U.S. nuclear force reductions in ways that maintain the reliability and effectiveness of security assurances to our allies and partners. The United States will consult with allies and partners in developing its approach to post-New START negotiations.

Strengthening Regional Deterrence and Reassuring U.S. Allies and Partners

The United States is fully committed to strengthening bilateral and regional security ties and working with allies and partners to adapt these relationships to 21st century challenges. Such security relationships are critical in deterring potential threats, and can also serve our non-proliferation goals – by demonstrating to neighboring states that their pursuit of nuclear weapons will only undermine their goal of achieving military or political advantages, and by reassuring non-nuclear U.S. allies and partners that their security interests can be protected without their own nuclear deterrent capabilities.

U.S. nuclear weapons have played an essential role in extending deterrence to U.S. allies and partners against nuclear attacks or nuclear-backed coercion by states in their region that possess or are seeking nuclear weapons. A credible U.S. “nuclear umbrella” has been provided by a



Defense Secretary Robert M. Gates conducts a press conference following the NATO Defense Ministerial in Istanbul, Turkey, Feb. 5, 2010. DoD photo by Cherie Cullen.

combination of means – the strategic forces of the U.S. Triad, non-strategic nuclear weapons deployed forward in key regions, and U.S.-based nuclear weapons that could be deployed forward quickly to meet regional contingencies. The mix of deterrence means has varied over time and from region to region.

In Europe, forward-deployed U.S. nuclear weapons have been reduced dramatically since the end of the Cold War, but a small number of

U.S. nuclear weapons remain. Although the risk of nuclear attack against NATO members is at an historic low, the presence of U.S. nuclear weapons – combined with NATO’s unique nuclear sharing arrangements under which non-nuclear members participate in nuclear planning and possess specially configured aircraft capable of delivering nuclear weapons – contribute to Alliance cohesion and provide reassurance to allies and partners who feel exposed to regional threats. The role of nuclear weapons in defending Alliance members will be discussed this year in

connection with NATO's revision of its Strategic Concept. Any changes in NATO's nuclear posture should only be taken after a thorough review within – and decision by – the Alliance.

In Asia and the Middle East – where there are no multilateral alliance structures analogous to NATO – the United States has maintained extended deterrence through bilateral alliances and security relationships and through its forward military presence and security guarantees. When the Cold War ended, the United States withdrew its forward deployed nuclear weapons from the Pacific region, including removing nuclear weapons from naval surface vessels and general purpose submarines. Since then, it has relied on its central strategic forces and the capacity to re-deploy nuclear systems in East Asia in times of crisis.

Although nuclear weapons have proved to be a key component of U.S. assurances to allies and partners, the United States has relied increasingly on non-nuclear elements to strengthen regional security architectures, including a forward U.S. conventional presence and effective theater ballistic missile defenses. As the role of nuclear weapons is reduced in U.S. national security strategy, these non-nuclear elements will take on a greater share of the deterrence burden. Moreover, an indispensable ingredient of effective regional deterrence is not only non-nuclear but also non-military – strong, trusting political relationships between the United States and its allies and partners.

Non-strategic nuclear weapons. The United States has reduced non-strategic (or “tactical”) nuclear weapons dramatically since the end of the Cold War. Today, it keeps only a limited number of forward deployed nuclear weapons in Europe, plus a small number of nuclear weapons stored in the United States for possible overseas deployment in support of extended deterrence to allies and partners worldwide. Russia maintains a much larger force of non-strategic nuclear weapons, a significant number of which are deployed near the territories of several North Atlantic Treaty Organization (NATO) countries.

The NPR concluded that the United States will:

- Retain the capability to forward-deploy U.S. nuclear weapons on tactical fighter-bombers and heavy bombers, and proceed with full scope life extension for the B-61 bomb including enhancing safety, security, and use control.
- Retire the nuclear-equipped sea-launched cruise missile (TLAM-N).
- Continue to maintain and develop long-range strike capabilities that supplement U.S. forward military presence and strengthen regional deterrence.
- Continue and, where appropriate, expand consultations with allies and partners to address how to ensure the credibility and effectiveness of the U.S. extended deterrent. No changes

in U.S. extended deterrence capabilities will be made without close consultations with our allies and partners.

Sustaining a Safe, Secure, and Effective Nuclear Arsenal

The United States is committed to ensuring that its nuclear weapons remain safe, secure, and effective. Since the end of U.S. nuclear testing in 1992, our nuclear warheads have been maintained and certified as safe and reliable through a Stockpile Stewardship Program that has extended the lives of warheads by refurbishing them to nearly original specifications. Looking ahead three decades, the NPR considered how best to extend the lives of existing nuclear warheads consistent with the congressionally mandated Stockpile Management Program and U.S. non-proliferation goals, and reached the following conclusions:

- The United States will not conduct nuclear testing and will pursue ratification and entry into force of the Comprehensive Nuclear Test Ban Treaty.
- The United States will not develop new nuclear warheads. Life Extension Programs (LEPs) will use only nuclear components based on previously tested designs, and will not support new military missions or provide for new military capabilities.
- The United States will study options for ensuring the safety, security, and reliability of nuclear warheads on a case-by-case basis, consistent with the congressionally mandated Stockpile Management Program. The full range of LEP approaches will be considered: refurbishment of existing warheads, reuse of nuclear components from different warheads, and replacement of nuclear components.
- In any decision to proceed to engineering development for warhead LEPs, the United States will give strong preference to options for refurbishment or reuse. Replacement of nuclear components would be undertaken only if critical Stockpile Management Program goals could not otherwise be met, and if specifically authorized by the President and approved by Congress.

Consistent with these conclusions, the NPR recommended:

- Funding fully the ongoing LEP for the W-76 submarine-based warhead and the LEP study and follow-on activities for the B-61 bomb; and
- Initiating a study of LEP options for the W-78 ICBM warhead, including the possibility of using the resulting warhead also on SLBMs to reduce the number of warhead types.

In order to remain safe, secure, and effective, the U.S. nuclear stockpile must be supported by a modern physical infrastructure – comprised of the national security laboratories and a complex of supporting facilities – and a highly capable workforce with the specialized skills needed to sustain

the nuclear deterrent. As the United States reduces the numbers of nuclear weapons, the reliability of the remaining weapons in the stockpile – and the quality of the facilities needed to sustain it – become more important.

Human capital is also a concern. The national security laboratories have found it increasingly difficult to attract and retain the most promising scientists and engineers of the next generation. The Administration's commitment to a clear, long-term plan for managing the stockpile, as well as to preventing proliferation and nuclear terrorism will enhance recruitment and retention of the scientists and engineers of tomorrow, by providing the opportunity to engage in challenging and meaningful research and development activities.

The NPR concluded:

- The science, technology and engineering base, vital for stockpile stewardship as well as providing insights for non-proliferation, must be strengthened.
- Increased investments in the nuclear weapons complex of facilities and personnel are required to ensure the long-term safety, security, and effectiveness of our nuclear arsenal. New facilities will be sized to support the requirements of the stockpile stewardship and management plan being developed by the National Nuclear Security Administration.
- Increased funding is needed for the Chemistry and Metallurgy Research Replacement Project at Los Alamos National Laboratory to replace the existing 50-year old facility, and to develop a new Uranium Processing Facility at the Y-12 Plant in Oak Ridge, Tennessee.

Looking Ahead: Toward a World without Nuclear Weapons

Pursuing the recommendations of the 2010 Nuclear Posture Review will strengthen the security of the United States and its allies and partners and bring us significant steps closer to the President's vision of a world without nuclear weapons.

The conditions that would ultimately permit the United States and others to give up their nuclear weapons without risking greater international instability and insecurity are very demanding. Among those conditions are success in halting the proliferation of nuclear weapons, much greater transparency into the programs and capabilities of key countries of concern, verification methods and technologies capable of detecting violations of disarmament obligations, enforcement measures strong and credible enough to deter such violations, and ultimately the resolution of regional disputes that can motivate rival states to acquire and maintain nuclear weapons. Clearly, such conditions do not exist today.

But we can – and must – work actively to create those conditions. We can take the practical steps identified in the 2010 NPR that will not only move us toward the ultimate goal of eliminating all nuclear weapons worldwide but will, in their own right, reinvigorate the global nuclear non-

proliferation regime, erect higher barriers to the acquisition of nuclear weapons and nuclear materials by terrorist groups, and strengthen U.S. and international security.