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A Roadmap for America's Nuclear Policy and Posture

SUMMARY

NTI co-chairs Ernest J. Moniz and Sam Nunn call on the United States and the other states with nuclear weapons to take immediate action to reduce the risk of a nuclear accident, mistake, or miscalculation. In six related policy papers, NTI provides an alternative vision and roadmap for America's nuclear policy and posture, as well as a template for Congress and the American people to evaluate the Trump administration's 2018 Nuclear Posture Review (NPR).

Introduction by Ernest J. Moniz and Sam Nunn

Papers by Steve Andreasen, Samantha Pitts-Kiefer, Leon Ratz, Brian Rose, and Lynn Rusten

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“Three Steps to Avert an Accidental Nuclear War”
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Roadmap for America’s Nuclear Policy and Posture policy papers
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Three Steps to Avert an Accidental Nuclear War

by Ernest J. Moniz and Sam Nunn

Bloomberg View

February 1, 2018

The world has crossed over to a new nuclear era, where a fateful error—rather than intentional aggression—is the most likely catalyst to nuclear catastrophe.

American leaders have been warned more than once of incoming Russian missiles—in each case, it was a false alarm resulting from technical or human error. Former Russian President Boris Yeltsin was mistakenly alerted to a possible U.S. missile strike after the launch of a Norwegian scientific rocket.

After every incident, we deceive ourselves that we can solve the problem with better technology and training—or we reassure ourselves that the combination of diligence and good luck we experienced during the Cold War will continue. But do we really believe we can prevent a nuclear catastrophe indefinitely in a world with nine states with nuclear weapons and significant suspicion and hostility in many of their mutual relationships?

The risks of human error involving nuclear weapons are compounded by the potential for deliberate cyber-threats to warning and command-and-control systems. Hackers could insert a false warning of a nuclear attack into national warning and alert systems and falsely attribute that attack to an innocent country. At a time of heightened global tensions—with too little communication or cooperation between nuclear rivals, and only minutes of decision time—how would leaders of states with nuclear weapons respond?

The Donald Trump administration recently declared plans to broaden the role of nuclear weapons in U.S. defenses beyond deterring nuclear attacks on the U.S. and our allies. Its new National Security Strategy states that the arsenal is now “essential” to preventing not just a nuclear attack but also “non-nuclear strategic attacks, and large-scale conventional aggression.” A leaked draft of its forthcoming Nuclear Posture Review has similar language.

Expanding the range of threats against which nuclear weapons might be used—which implies, for example, “strategic” cyberattacks—will greatly increase the risks of miscalculation or blunder. If a cyberattack took out a major part of our electrical grid, would we be able to quickly and confidently identify the attacking country?

If Russia, China, India, Pakistan and others adopt similar policies, are we moving down a path where nuclear use becomes highly probable?

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Every country with nuclear weapons perceives its geopolitical circumstances differently, but we all face substantially increasing nuclear risks. Individually where necessary, and together where possible, they must move with urgency on policies that can reduce these risks for all nations. We recommend three initial steps.

First, countries with nuclear weapons should continuously review and protect against the vulnerability of their nuclear warning and command systems to cyber-threats. The focus should be on correcting current weaknesses and instituting a process of continuing assessment and updates. Some findings and conclusions could be shared with other nuclear powers—reducing risks for all. Each should recognize that a cyberattack against nuclear warning and command systems is a prescription for global disaster.

Second, despite significant disagreements on many global issues, the U.S., Russia and other nuclear-armed nations must work together on areas of existential common interest—chief among them, reducing the risk of a nuclear error. Once fired, a nuclear ballistic missile unfortunately cannot be recalled before it reaches its target.

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Removing U.S. and Russian nuclear weapons from Cold War-era “prompt-launch” postures—where they are ready to launch and hit their targets within minutes—would eliminate “hair-triggers” and increase decision time for leaders. In doing so, Washington and Moscow would set an example for all states with nuclear weapons. Military experts in each of these countries should be mandated by their leaders to explore this and other options that would give them more time to make fateful decisions about nuclear use.

Third, the U.S. and Russia should reinforce the principle—articulated eloquently by Ronald Reagan and Mikhail Gorbachev—that a nuclear war cannot be won and must never be fought. Have the two largest nuclear powers already forgotten this powerful historical breakthrough that was essential to ending the Cold War?

The most immediate priority should be to structure and posture U.S. and Russian nuclear forces to deter nuclear use and reduce the risk of an accidental, mistaken or unauthorized launch. Against this backdrop, the current Russian concept of “escalate to de-escalate”—i.e., limited nuclear use designed to create a pause in the conflict and open a pathway for a negotiated settlement on Moscow’s terms—and U.S. calls for more “usable” nuclear weapons taken together make the world a vastly more dangerous place.

The U.S. must have a safe, secure and reliable nuclear deterrent as long as nuclear weapons exist. But in today’s nuclear era it is not enough. There is still time for the world to come together to reduce and ultimately eliminate nuclear threats—most urgently by taking action to reduce the risk of an accident, mistake or miscalculation. This should be a core principle and key objective shaping the Trump administration’s nuclear policy.

Ernest J. Moniz and Sam Nunn

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Preventing Nuclear Use

As was true throughout the Cold War, preventing nuclear use by a nation state or non-state actor remains a vital national security interest of the United States. **Thus, deterring and reducing the risk of nuclear use must remain the foundation of America's nuclear policy and posture—and the United States should make clear the purpose of U.S. nuclear weapons is to deter the use of nuclear weapons by others.**

Although our vital national security interest in preventing nuclear use is clear, the world is now moving in the wrong direction. Today's nuclear world—including a growing number of nations with nuclear arms in volatile regions, technological advances, the continuing threat of nuclear terrorism and cyberattacks—poses high and potentially unmanageable risks, including the dangerous possibility of an accident, mistake, miscalculation, or blunder by one of many nuclear-capable actors leading to nuclear use.

For this reason, the United States must also continually seek to move forward with other states with nuclear weapons on practical steps that reduce the role and risks of nuclear weapons in global security policies. We must promote a safer and more stable form of security that does not rely primarily on nuclear weapons or nuclear threats to maintain international peace and security—and persuade others to move with us.

Possible steps include:

- 1. Reaffirm our vital national security interest in preventing nuclear use.**
Reduce the risk of an accidental, mistaken, or unauthorized launch of a nuclear ballistic missile—or a blunder that leads to a nuclear catastrophe. Consistent with reducing the role and risks of nuclear weapons in global security policies, state that the purpose of U.S. nuclear weapons is to deter the use of nuclear weapons by others—and avoid issuing nuclear threats or a strategy for limited nuclear use that will encourage others to do the same.
- 2. Reaffirm the vision of working toward a world free of nuclear weapons through practical, concrete steps that improve our security today.**
Continuing support for the vision of a world free of nuclear weapons is essential for America's national security interests and leadership in strengthening the Nuclear Non-Proliferation Treaty. The vision needs translation into practical steps that continuously reduce the risks of nuclear use. Without the bold vision, the actions will not be perceived as fair or urgent. Without the actions, the vision will not be perceived as realistic or possible.
- 3. Reconcile strategic modernization of our nuclear forces in the context of our deterrence needs, overall defense budget priorities, and emphasis on increasing stability and reducing reliance on nuclear weapons over time.** The President and Congress should support what is necessary for maintaining a safe, secure, and credible nuclear posture while reducing the risk of

Deterring and reducing the risk of nuclear use must remain the foundation of America's nuclear policy and posture.

nuclear use and avoiding unnecessary costs. Strong deterrence involves more than nuclear forces and we must at the same time sustain the competitive edge of our conventional forces and build the capacities needed to deal with terrorism, as well as new and emerging strategic threats like cyberattacks.

4. **Forgo new nuclear weapon types, capabilities, or basing options.** Today, the United States has a robust nuclear deterrent—with a significant number of warheads on day-to-day alert—that provides a flexible capability to deter nuclear use or destroy any potential nuclear adversary. The United States does not need to build new nuclear weapons types with new capabilities, or expand nuclear missions. Calls for more “usable” nuclear weapons make nuclear weapons use more probable.

The nuclear policy and posture course Washington sets now may well determine America's path for the next decade. If the world's greatest military power decides it cannot defend itself without new nuclear weapons and issues threats of nuclear use, and forgoes America's historic—and moral—commitment to reducing and ultimately eliminating nuclear dangers, it will send exactly the wrong signal. And that wrong signal will be sent at a time when international efforts to discourage the spread of nuclear weapons are under severe challenge. The United States has a unique responsibility and imperative to lead and set the right course.

Engaging in Nuclear Dialogue

It is dangerous for the United States, for Russia, and for the world when Washington and Moscow have very limited communication and virtually no dialogue on reducing nuclear risks. We have stark differences with Russia, but there are also areas of existential common interest—chief among them reducing the risk of a nuclear mistake or blunder—where all can and should agree that we must work together to avoid catastrophe, as we did during the Cold War. Other nuclear nations—including the United Kingdom, France, and China—must also be engaged in this new nuclear dialogue focused on reducing the risk of nuclear use.

Engaging Russia on the parameters of a new nuclear dialogue is the crucial first step to reducing the risk of nuclear use between the United States and Russia—and globally. The objective of this new dialogue would be to re-establish as a core principle the goal of reducing the role and risks of nuclear weapons in global security policies as an essential part of Washington and Moscow's overall security posture without jeopardizing the security of either of the parties or their allies—and develop specific steps consistent with this core principle. In addition to nuclear forces (strategic and tactical), a new dialogue must include over time missile defenses, prompt-strike capabilities, conventional forces, cybersecurity, and space.

Although the United States and Russia will have to work bilaterally to begin and advance key elements of an agenda to reduce the risks of nuclear use, both Europe and China will need to be engaged, and their perspectives taken into account.

An immediate priority of this new dialogue should be to identify concrete, practical, near-term initiatives designed to reduce risks, rebuild trust, and improve today's global security landscape. These near-term steps should be presented so that publics understand why such steps will make them safer and more secure.

Possible steps include:

1. **Presidential Joint Declaration.** The starting point for reducing nuclear dangers could be a new Presidential Joint Declaration by the United States and Russia confirming that a nuclear war cannot be won and must never be fought. This initiative is inherently presidential, could be agreed quickly, and would be positively received by publics. This initiative could include other states with nuclear weapons, in particular the United Kingdom, France, and China.
2. **Military-to-military communication.** Elevating bilateral military-to-military dialogue between the United States and Russia, essential throughout the Cold War, should be an immediate and urgent priority. Within the Euro-Atlantic region, a new military crisis management group should also be instituted. The focus of these initiatives should be on reducing risks of a catastrophic mistake or accident by restoring communication and increasing transparency and trust—another initiative that publics would understand and support.

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3. **Cyber dialogue.** Cyberattacks from state or non-state actors can lead to the theft of nuclear materials or sabotage to a nuclear facility, false warning of a missile attack, or the intrusion into nuclear command and control systems. The aftermath of a cyberattack could be catastrophic, potentially leading to use of a nuclear weapon. Reducing and eliminating cyber nuclear risks is an existential common interest for all nations. Discussions with Russia and other states with nuclear weapons are imperative for reaching at least informal understandings on cyber dangers related to nuclear facilities, strategic warning systems, and nuclear command and control. These dangers should be urgently addressed to prevent the potentially catastrophic consequences of a cyberattack on a nuclear facility or war by mistake. As a first priority, recognizing the dynamic nature of the cyber threat, nations must continuously review and protect against the vulnerability of their nuclear warning and command and control systems to these threats. Nations should also work to develop and adopt “rules of the road” in the nuclear cyber world, including at the top of the list no cyberattacks on warning and command and control systems.
4. **Dialogue with China.** Regular and sustained bilateral nuclear dialogue between the United States and China is also essential for building transparency and trust. Although some nuclear issues may begin as bilateral points between the United States and China in the Asia-Pacific region, other nuclear issues might be multilateral, and still other nuclear issues might have broad implications for other regions. North Korea's nuclear and missile programs must be a top priority for discussions. Washington and Beijing must have a common understanding on overall regional security and then on goals and strategy for negotiations with North Korea, and work on this common understanding should be our focus.
5. **P5 nuclear dialogue.** A renewed P5 nuclear dialogue focused on tangible steps to reduce nuclear risks could be important to maintaining and strengthening the Nuclear Non-Proliferation Treaty. The two leading nuclear powers—the United States and Russia—must lead, and other countries in possession of nuclear weapons must also contribute to a joint enterprise focused on decisively reducing nuclear risks.
6. **Dialogue to prevent nuclear terrorism and a “dirty bomb.”** Enhancing radiological security to prevent a dirty bomb attack could be advanced with a new U.S.-Russia Initiative to Prevent Nuclear Terrorism, working with other states with nuclear weapons.

A new nuclear dialogue with Russia and other states with nuclear weapons could be the beginning of a historic and long-overdue transformation of global nuclear policies. Most important, the process could assist countries in overcoming many of the political fears and divides that currently exist. Beyond security policy, it could also provide an impetus to cooperation on an even broader front, including economics, energy, and other vital areas.

Increasing Warning and Decision Time

T rue progress on reducing nuclear risks—and true cooperation necessary to prevent proliferation and nuclear terrorism—is not possible when both Washington and Moscow are postured for mutually assured destruction on a massive scale. If leaders cannot see and act on this premise, the United States and Russia will remain trapped in a costly and risky nuclear posture—and other nations may follow in their footsteps, making probable that Hiroshima and Nagasaki are not the last cities to suffer a nuclear attack.

Today, U.S. and Russian ballistic missiles armed with nuclear warheads deployed on prompt launch can be fired and hit their targets within minutes. Once fired, a nuclear ballistic missile unfortunately cannot be recalled before it reaches its target. Leaders may have only minutes between warning of an attack and nuclear detonations on their territory planned to eliminate their capacity to respond. This puts enormous pressure on leaders to maintain “launch on warning/launch under attack” options, which—when mutual tensions persist or in a crisis—increases the risk that a decision to use nuclear weapons will be made in haste after a false warning and multiplies the risk of an accidental, mistaken, or unauthorized launch—blundering into nuclear catastrophe.

Magnifying risks of a nuclear mistake are cyber threats to warning and command and control systems. Issues surrounding decision time become more acute in a world of increased cyber risks and little communication or cooperation between political and military leaders. Malicious hackers today may insert the same message that panicked Hawaiians in January 2018—“Ballistic missile threat inbound ... seek immediate shelter. This is not a drill”—into national warning and alert systems. How would the leaders of Pakistan, India, North Korea, the United States, Russia, China, the United Kingdom, France, or Israel respond?

Washington should work with Moscow to eliminate Cold War-era capabilities and force postures that generate fears of a disarming first strike. Working with Russia to take nuclear missiles off prompt-launch status would increase time for leaders to assess their options and make a more considered decision in response to a suspected or actual nuclear attack. This would significantly reduce the risk of an accidental, mistaken, or unauthorized launch of a nuclear ballistic missile, and set an example for all states with nuclear weapons. Ideally, this could be extended to China, and then to India and Pakistan.

This initiative would be widely understood by publics as a step away from the still-prevailing concept of mutually assured destruction, and could serve as a building block in a broader effort to improve relations between the West and Russia. Importantly, disengaging the Cold War autopilot would in no way diminish U.S. military capability to deter and defend against any nation or combination of nations; even with these steps, the United States will continue to have sufficient if not excessive capacity in its nuclear arsenal.

Issues surrounding decision time become more acute in a world of increased cyber risks and little communication or cooperation between political and military leaders.

Possible options for increasing warning and decision time and removing weapons from prompt launch include:

1. **Set the goal of removing all nuclear weapons from prompt-launch status globally over the next decade.** Progress on removing nuclear weapons from prompt launch in the United States and Russia could be the basis for a global norm against retaining or adopting prompt-launch postures. The United States and Russia could begin a dialogue with other states with nuclear weapons in anticipation of a subsequent agreement not to deploy warheads on prompt launch.
2. **Reciprocal U.S.-Russian commitments to remove a percentage of missiles and warheads from prompt launch.** The United States and Russia could announce plans to take a percentage of their strategic nuclear forces off prompt launch within three to five years. Initial steps would also include discussions on procedures, observations, and inspections to build confidence and trust, which will be necessary to address the challenges involved in eventually removing all weapons from prompt launch.

Lowering prompt-launch capabilities of the intercontinental ballistic missile (ICBM) force would be the immediate priority. Given the asymmetries in U.S. and Russian force postures (where Russia depends more heavily on ICBMs), even this limited step to remove a percentage of missiles and warheads from prompt launch may require a limited step relating to the submarine launched ballistic missile (SLBM) force. That said, verifiably removing SLBMs and their warheads from prompt launch will be more challenging than for ICBMs.

3. **Agreed tiered U.S.-Russian strategic force postures.** The United States and Russia could limit the number of warheads on prompt-launch status to several hundred as part of a tiered force posture. This posture would have a first tier with a limited number of weapons on prompt-launch status, a second tier with delayed response of days or perhaps weeks, and a third tier that required longer periods to be brought back to readiness. The objective would be to move most strategic forces to the second and third tiers while ensuring against a situation where there is pressure in a crisis to rush to move forces back into the first tier.

Complementary to removing weapons from prompt launch to increase warning and decision time for leaders, the United States should as a matter of policy promote secure, reliable, and survivable strategic nuclear warning and command and control systems. This should include discussions with Russia and other states with nuclear weapons for reaching at least informal understandings on reducing cyber threats to these systems.

Moving decisively from mutually assured destruction by eliminating capabilities that generate fears of a disarming first strike would deliver on America's historic support for practical, concrete steps that meet the test of increasing stability, reducing nuclear dangers, and sustaining progress toward a world ultimately free of nuclear weapons. It would reduce the risk of an accident or miscalculation; improve American security by strengthening the cooperation necessary to address regional conflicts, proliferation, and terrorism; and give the U.S. military and those of its allies and partners greater flexibility and resources to develop capabilities against emerging threats.

Moving to a Safer, More Secure, More Credible Nuclear Posture in Europe

The negative political dynamic between the North Atlantic Treaty Organization (NATO) and Russia today is the frame for any discussion of NATO defense policy and posture, including NATO's nuclear posture. Within this frame, unity within the alliance takes on a special meaning. NATO is averse to taking steps that might create controversy or suggest a lack of cohesion in the face of a newly aggressive Russia, and the United States must be resolute in its commitment to the defense of NATO. This stance especially has bearing today given the uncertainty that has engulfed the Trump administration's relationships with NATO and with Russia.

The principle of collective defense enshrined in article 5 of the Washington Treaty is essential, and any changes to NATO's defense policy and posture must be seen through that lens; however, the current security environment should not preclude Washington and NATO from reviewing NATO's nuclear posture. In fact, NATO's security requires a hard look at and new approaches to NATO deterrence and defense through the prism of reducing the risk of nuclear use. Forward-deployed U.S. nuclear weapons in Europe increase the risk of accidents, blunders, or catastrophic terrorism and invite pre-emption. Given these added risks, it is past time to revisit whether these forward-based weapons are essential for military deterrence and political reassurance. The Trump administration's National Security Strategy of December 2017 commits to this continued deployment without presenting the considered analysis that would emerge from a hard look.

There are strong arguments for NATO to move to a safer, more secure, and more credible nuclear posture without forward-deployed U.S. nuclear weapons in Europe. The challenge is how to advance current thinking about the military and political dimensions of alternative nuclear postures.

Regarding the military side of the ledger, it seems clear that consolidating U.S. nuclear weapons now stored in Europe back to the United States would not diminish U.S. and NATO nuclear capabilities. Several former senior U.S. officials and military leaders have made the point that U.S. nuclear weapons based in Europe have virtually no military utility, primarily because of the extremely demanding scenario for conducting a nuclear strike mission using NATO dual-capable aircraft (DCA). In addition to the complicated procedures for decision making related to nuclear use, any attempt to use those weapons will be further complicated by the visibility of the many actions required to prepare the aircraft, weapons, and crews for such an attack—all of which undercut their survivability and plausible use. Moreover, those factors make forward-deployed nuclear weapons potential targets in the early phases of a conflict, perhaps triggering a chain of events that the United States and NATO would want to avoid: early nuclear use. In short, forward-deployed nuclear weapons in Europe have military liabilities, and they may, in fact, increase the risk of nuclear use in a crisis. These dangers also apply to Russia's forward-deployed nuclear weapons. Taken together, these shorter-range weapons in western Russia and in Europe are a clear and present danger to both Russia and NATO, particularly in an era of tensions but also in an era of possible nuclear terrorism.

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What remains true and credible is that the United States has a robust strategic nuclear deterrent that is capable of being used deliberately anywhere on the globe in defense of U.S. interests and U.S. allies—and it is, and should be, understood by any potential (and rational) adversary to NATO, including Russia, in exactly this way. In any crisis involving NATO, U.S. nuclear capabilities would also be on stage with the nuclear forces of the United Kingdom and France. Indeed, as NATO has repeatedly stated, “The supreme guarantee of the security of the Allies is provided by the strategic forces of the Alliance.” This position has been, and remains, the credible foundation for any plausible scenario for using U.S. nuclear weapons.

On the security side of the ledger, although returning forward-deployed nuclear weapons to the United States would not diminish NATO nuclear capabilities, it would unquestionably reduce the risks from a potential terrorist incident or political instability—both of which are inherent in a posture that stores nuclear weapons at multiple sites across multiple countries. It is a reality that terrorists with global reach seek nuclear capability and have operated at NATO’s border and within some NATO countries as well as Russia.

Now is the time and the opportunity to ask whether those weapons are more of a security risk than an asset to NATO and whether they increase or reduce the risk of nuclear use.

Finally, the financial side of the ledger is harder to calculate, complicated by a number of assumptions related to absolute and marginal costs for Washington and its NATO allies. Any savings that might be accrued by removing forward-deployed B61s from Europe and reducing the overall purchase of B61-12s present only modest marginal costs for the United States. For NATO allies of the United States, however, the marginal costs of procuring and maintaining DCA—and supporting U.S. nuclear weapons stored in Europe—may be relatively larger. That said, any reduction in costs associated with the nuclear mission could free resources for NATO to focus on other urgent tasks, including conventional reassurance and cyber defense, depending on decisions made by NATO member countries about their national defense budgets.

One thing is certain: although leadership cannot come from Washington alone, U.S. leadership is the essential prerequisite to a reexamination of NATO nuclear policy, beginning with a compelling reaffirmation by the president of the principle of collective defense enshrined in article 5 of the Washington Treaty. Washington must also take steps to work with allies to sustain, adapt, and perhaps enhance NATO’s current procedures for nuclear sharing and consultations, consistent with a safer, more secure, and more credible nuclear deterrent. Such steps will not preclude the B61-12 life extension program (which also has a role in U.S.-based strategic forces) or plans by some NATO allies to purchase F-35 aircraft. Maintaining some DCAs and trained pilots in Europe, along with a residual support infrastructure for nuclear weapons, should also be part of the overall NATO nuclear deterrence review.

The implications of sustaining or removing U.S. forward-deployed nuclear weapons in Europe are serious. Now is the time and the opportunity to ask whether those weapons are more of a security risk than an asset to NATO and whether they increase or reduce the risk of nuclear use.

Arms Control—Extending New START, Preserving INF, Supporting Further Reductions, and Strengthening Verification

The United States should continue to support and advance practical, concrete steps that meet the test of reducing nuclear dangers, increasing security, and sustaining progress toward a world free of nuclear weapons. Historically, bilateral and multilateral nuclear arms control and confidence-building measures have played a significant role in advancing these objectives. However, the foundation of arms control and confidence building that has curbed the nuclear arms race and enhanced strategic stability between the nuclear superpowers during and after the Cold War is eroding and in danger of collapse.

Preserving and revitalizing this foundation is critical to continue progress in verifiably reducing global nuclear stockpiles, preventing proliferation, and increasing stability—including specific steps that would not require new legally binding treaties but could help facilitate treaties where necessary. To this end, the United States should extend the New Strategic Arms Reduction Treaty (New START) with Russia; continue efforts to preserve the Intermediate-Range Nuclear Forces Treaty (INF) by urging Russia to return to compliance; reinvigorate dialogues with Russia and with the wider group of states with nuclear weapons to advance the reductions and limitation process; and collaborate with others to develop the verification tools needed for agreements that should in the future address not only delivery vehicles, but also nuclear warheads and the entire nuclear fuel cycle.

Possible steps include:

1. **Extend the New START Treaty.** New START entered into force on February 5, 2011, and has a duration of 10 years, but by its own terms can be extended for an additional five years. The Treaty requires the United States and Russia to meet their central limits of 1,550 deployed nuclear warheads; 700 deployed intercontinental ballistic missiles (ICBMs), submarine-launched ballistic missiles (SLBMs), and heavy bombers equipped for nuclear armaments; and 800 deployed and non-deployed ICBM launchers, SLBM launchers, and heavy bombers equipped for nuclear armaments by February 5, 2018. It includes robust verification and transparency measures including numerous on-site inspections and exhibitions, data exchanges and notifications related to strategic offensive arms and facilities covered by the Treaty, and provisions to facilitate the use of national technical means for Treaty monitoring. Both countries are complying with the agreement and met its central limits as required by the Treaty deadline of February 5, 2018.

The Treaty will expire on February 5, 2021, unless the parties agree to extend it. Extending New START is strongly in their mutual interest and the United States and Russia should agree early in 2018 to extend the Treaty to enhance predictability and eliminate uncertainty about whether the Treaty's limits and verification provisions will remain intact after 2021. New START provides an essential foundation of limits and verification upon which additional measures can be pursued, and it can be supplemented or superseded by a future agreement.

Extending New START now would ensure a significant degree of predictability and stability in an increasingly complex and dynamic world. New START's robust verification regime provides the United States and Russia with a critical source of information about their respective nuclear forces. This allows the United States to make better decisions about its own nuclear arsenal. Verification measures—including on-site inspections, mutual notifications, and data exchanges—reduce incentives for either party to cheat on their obligations or engage in an arms race due to a lack of information about the other party's nuclear forces. No other treaty currently allows for such access to the Russian nuclear weapons program and vice versa. Without the agreement, Russia's strategic forces would not be subject to limits and U.S. defense planners would face growing uncertainties about future Russian capabilities. The predictability and limits New START provides help to discourage the reemergence of a nuclear arms race. New START was approved with overwhelming bipartisan support and its successful implementation and extension merit continued bipartisan support.

2. **Preserve the Intermediate-Range Nuclear Forces (INF) Treaty.** The INF Treaty between the United States and the former Soviet Union entered into force in 1988 and is of indefinite duration. It banned the possession, production, or flight-testing of all U.S. and Russian intermediate- and short-range (500–5,500 km) ground-launched ballistic and cruise missiles (GLBMs and GLCMs), and production or possession of launchers of such missiles. The Treaty resulted in the complete and verified elimination of this class of U.S. and Russian weapons by 1991. It was a foundational treaty, including its groundbreaking intrusive verification provisions (now expired) that were later adapted for future treaties including New START, and has made a significant contribution to mutual security in the Euro-Atlantic region.

Unfortunately, the INF Treaty's status and future is in doubt. In 2014, the United States made public its determination that Russia was in violation of its INF Treaty obligations with respect to GLCMs and their associated launchers, and subsequent press reports indicate Russia has flight-tested and deployed intermediate-range GLCMs. Russia denies the violation and has failed to respond substantively to questions raised by the United States regarding the GLCM in question. Instead, Russia has responded with allegations of its own concerning U.S. compliance with the Treaty. The United States does not view these allegations as equivalent, but has endeavored to provide substantive responses to Russian's concerns.

The United States and its allies should continue to raise the issue and strenuously encourage Russia to return to verifiable compliance. The erosion of the INF Treaty regime is damaging to security and mutual trust in the Euro-Atlantic, a development detrimental to the interests of European nations, the United States, and Russia. Failure to resolve the issue is an obstacle to restoring trust and reducing nuclear dangers.

The United States should respond to Russia's violation by ensuring that Russia gains no military advantage from its violation. This can be done without reintroducing U.S. INF-banned systems in Europe. The United States does not need to and should not withdraw from or suspend its participation in the Treaty, as this would give Russia a legal option to do the same. Doing so would take the onus off of Russia for the demise of the Treaty, and would enable Russia to freely deploy INF-prohibited systems without constraint, removing any incentive to return to compliance or limit the numbers of INF-range systems it deploys. Because the United States has other means to prevent

Russia from gaining a military advantage from its violation, it should not go down the destabilizing and costly path of research, development, and potential deployment of INF-prohibited systems in Europe. This is militarily unnecessary, would be divisive in NATO, and is counterproductive to the security environment in Europe. The message needs to be clear: a flexible nuclear deterrent is available to respond to any form of nuclear use against the United States or its allies.

In this environment where the INF Treaty is at risk and its future uncertain, the extension of New START is all the more important. So long as Russia continues to comply with New START, it is in the United States' interest to maintain its limits, verification, and predictability. Extension of New START should not be seen as a reward to Russia, or something to withhold in the face of its INF violation. Rather, New START should be viewed as an essential foundation of mutual nuclear regulation between the United States and Russia whose preservation is important to reducing existential nuclear risks and establishing a floor under the negative spiral in U.S.-Russian relations.

- 3. Support further reductions.** Reducing nuclear dangers and advancing nuclear nonproliferation requires that the United States continue to lay the groundwork for and pursue additional bilateral and multilateral measures and agreements to reduce nuclear weapons and materials. The United States should continue to plan for, pursue, and help create the conditions conducive to further bilateral and multilateral nuclear arms reductions and limitations, and other measures such as a multilateral fissile material cut-off treaty, to advance step-by-step progress toward the ultimate goal of a world free of nuclear weapons. Further progress on nuclear reductions with Russia will require addressing a broader set of issues affecting strategic stability. As the reductions process proceeds, it will be necessary and desirable to involve additional countries with nuclear weapons and to address not only nuclear weapons delivery vehicles but also nuclear warheads and materials.

- 4. Strengthen verification.** Verification is a critical component of the nuclear reductions process, and the challenges and requirements for verification become more demanding as reduction agreements call for lower numbers and seek to regulate not only weapons delivery vehicles but also nuclear warheads and the materials required for producing and maintaining them. Significant effort and resources are being devoted to these matters across governments, academia, and other non-governmental organizations. This work should be intensified and allocated sufficient resources to ensure the verification challenges are understood and met as progress on bilateral and multilateral reductions and limitations proceeds.

NTI is engaged with the U.S. Department of State in leading efforts with a group of more than 25 states with and without nuclear weapons on the International Partnership for Nuclear Disarmament Verification (IPNDV). This collaborative effort is focused on identifying the challenges associated with nuclear disarmament verification and identifying potential procedures and technologies to address those challenges. The IPNDV is an example of how the public and private sectors can join together on a global basis to make practical contributions to the field of disarmament and its essential verification component.

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Securing Nuclear Weapons and Materials

Weapons-usable nuclear materials remain located at hundreds of sites in 22 states around the world. Despite considerable progress made since 2010, in particular due to the Nuclear Security Summit (NSS) process, major challenges remain. There is still no global nuclear security system or set of international standards and best practices that all states follow; the state of security of nuclear facilities and materials remains uneven around the world, particularly in the case of measures to protect against cyber threats; several states continue to increase their stockpiles of weapons-usable nuclear materials; and states continue to avoid participating in confidence-building measures that would allow others to hold them accountable for their nuclear security commitments and obligations. These challenges are likely to be exacerbated because there is currently no forum to sustain and build on the momentum of the summits.

Moreover, the decades-old cooperation between the United States and Russia on nuclear security has come to an abrupt end. Russia pulled out of the Nuclear Security Summit process in 2016, has avoided participation in the Nuclear Security Contact Group (the group of NSS states that have agreed to continue meeting after the NSS ended to track and promote continued implementation of NSS commitments), and has played an obstructionist role in several global forums pertaining to nuclear security. It also suspended several nuclear security-related agreements, including the Plutonium Management and Disposition Agreement, leaving the world's largest nuclear complex largely isolated from the international community.

Future nuclear security efforts should focus on (1) strengthening the global nuclear security architecture, including by building mechanisms to ensure accountability; (2) minimizing and, where possible, eliminating stocks of weapons-usable nuclear materials and the number of sites at which they are located; (3) seeking opportunities to re-engage Russia and other major nuclear powers on nuclear security; (4) addressing emerging threats to nuclear security; and (5) ensuring effective security of military materials, including nuclear warheads.

Possible steps include:

1. **Sustain the progress achieved during the NSS process and address remaining gaps in the global nuclear security architecture.** This includes ensuring the success and long-term viability of the Nuclear Security Contact Group as a mechanism for sustaining international engagement and progress on nuclear security issues and ensuring that the 2021 Review Conference of the Convention on Physical Protection of Nuclear Materials (CPPNM), as amended, is robust and substantive and that it results in agreement to hold a review conference every five years. To ensure accountability, states should help build confidence in the effectiveness of their security practices and take reassuring actions to demonstrate that all nuclear materials and facilities are secure. Moreover, additional resources should be provided to the International Atomic Energy Agency (IAEA) for its important nuclear security mission.
2. **Minimize and, where possible, eliminate stocks of weapons-usable nuclear materials and locations where they are located.** Minimization, elimination, and consolidation of stocks of weapons-usable nuclear material will contribute to significant threat reduction, leaving terrorist

groups with fewer potential targets for theft of nuclear materials. Future efforts should focus on codifying highly enriched uranium (HEU)-free zones in regions that are already free of HEU, such as South America and Southeast Asia; continuing to support the eventual elimination of all HEU globally, through HEU reactor conversions, HEU repatriation efforts, and minimizing the use of HEU for medical isotope production; and developing cost-effective plutonium management and disposition strategies.

3. Seek opportunities to re-invigorate nuclear security cooperation with Russia and other states.

As the world's two largest nuclear powers, the United States and Russia have a special obligation to cooperate on nuclear security. Future cooperation need not take the form of unilateral technical assistance, but rather be based on the principles of mutual benefit and equality. Priorities can focus on (1) sustaining nuclear security of materials at facilities and in transit; (2) insider threat mitigation; (3) illicit trafficking prevention; (4) emergency preparedness and response; and (5) radiological security to prevent a dirty bomb attack. This work could be done in the context of a new U.S.-Russia Initiative to Prevent Nuclear Terrorism. Moreover, the United States should re-invigorate nuclear security cooperation with other states with nuclear weapons, including China, India, and Pakistan.

4. Address emerging cyber threats to nuclear facilities. A cyberattack against a nuclear facility could facilitate the theft of nuclear materials or an act of sabotage leading to catastrophic radiation release. Yet most states are not effectively prepared to deal with this emerging threat. New strategies and approaches to nuclear security are needed to comprehensively address the cyber threats facing nuclear facilities today.

5. Ensure effective security of military nuclear materials, including nuclear warheads. Military nuclear materials remain outside the scope of international nuclear security standards and confidence-building arrangements. Efforts should be undertaken to encourage states to declare and give assurances that their military materials are secured to the same or higher standards as those applied to comparable civilian nuclear materials. Moreover, states should pursue confidence-building measures such as reporting, best practice exchanges, trainings, and peer reviews to build confidence in the security of these materials.

As the world's two largest nuclear powers, the United States and Russia have a special obligation to cooperate on nuclear security.

About the Authors

Ernest J. Moniz is co-chair and chief executive officer of the Nuclear Threat Initiative. Moniz served as U.S. Secretary of Energy from 2013–2017. He is the Cecil and Ida Green Professor of Physics and Engineering Systems emeritus at the Massachusetts Institute of Technology and special advisor to the MIT President. He also is CEO of the non-profit Energy Futures Initiative.

Sam Nunn is co-chair of the Nuclear Threat Initiative, which he co-founded with philanthropist Ted Turner in 2001. He served as a U.S. Senator from Georgia for 24 years. He also serves as a distinguished professor at the Sam Nunn School of International Affairs at the Georgia Institute of Technology.

Steve Andreasen is a national security consultant to NTI and teaches courses on National Security Policy and Crisis Management in Foreign Affairs at the Hubert H. Humphrey School of Public Affairs, University of Minnesota. Previously, he served as director for Defense Policy and Arms Control on the U.S. National Security Council at the White House from February 1993 to January 2001. He was the principal advisor on strategic policy, nuclear arms control, and missile defense to the National Security Advisor and the President. His articles and opinion pieces have been published in *Foreign Affairs*, the *Washington Post*, *Los Angeles Times*, *Politico*, *Arms Control Today*, the *Guardian* and many other domestic and international publications.

Samantha Pitts-Kiefer is senior director of NTI's Global Nuclear Policy Program. She has led two major projects—the NTI Nuclear Security Index and the Global Dialogue on Nuclear Security—and her current focus includes cyber security of nuclear weapons and related systems and nuclear facilities, U.S.-Russia relations, and nuclear weapons policy and disarmament. She has an M.P.A. degree from the Harvard Kennedy School, where she focused on foreign policy and national security and received the Donald K. Price Award for academic excellence and community service. Previously, she practiced law at Simpson Thacher & Bartlett LLP and clerked for the Honorable Maryanne Trump Barry on the U.S. Court of Appeals for the Third Circuit. Pitts-Kiefer is a term member of the Council on Foreign Relations. She holds a B.A. from St. Olaf College and a J.D. from Villanova University School of Law, where she was elected to the Order of the Coif.

Leon Ratz is a program officer with NTI's Material Security and Minimization program. He works on issues pertaining to the security of military nuclear materials, Russian nuclear security, and other nuclear security and non-proliferation matters. Previously, Ratz worked for the Pacific Northwest National Laboratory as a policy specialist on Russian nuclear security in the Office for International Material Protection and Cooperation in the U.S. National Nuclear Security Administration. He holds a bachelor's degree from Boston College and a master's degree from the Harvard Kennedy School. While at the Kennedy School, Ratz worked as a student associate at Harvard University's Project on Managing the Atom and published a report on the national security implications of the dissolution of the U.S. Arms Control and Disarmament Agency.

Brian Rose is a program officer with the Global Nuclear Policy Program, where he works on issues pertaining to deterrence and strategic stability, European security, emerging and disruptive technologies, and U.S. nuclear policy. Prior to joining NTI, Rose served in analytical, program management, and outreach positions at Lawrence Livermore National Laboratory, the United States Institute of Peace, the U.S. Department of State, and George Washington University. Rose holds a B.A. in political science from St. Mary's College of Maryland and an M.A. in International Science and Technology Policy from the Elliott School of International Affairs at George Washington University.

Lynn Rusten is a senior advisor to NTI's Global Nuclear Policy Program. Before joining NTI, she served as the senior director for Arms Control and Nonproliferation on the White House National Security Council staff and held positions at the Department of State including chief of staff for the Bureau of International Security and Nonproliferation and senior advisor in the Bureau of Arms Control, Verification and Compliance (AVC). In this capacity in AVC, she led the interagency backstopping process supporting the negotiation and ratification of the New START Treaty. Previously, Rusten was a senior professional staff member on the Senate Armed Services Committee, handling a wide range of foreign and defense policy issues, held a variety of positions in the Department of State and at the U.S. Arms Control and Disarmament Agency (ACDA), and was director of the National Academy of Sciences' Committee on International Security and Arms Control. She has an M.S. in National Security Strategy from the National War College; an M.A. in Russian and East European Studies from the University of Michigan; and a B.A. in Government with High Honors from Oberlin College.

About the Nuclear Threat Initiative

The Nuclear Threat Initiative works to protect our lives, environment, and quality of life now and for future generations. We work to prevent catastrophic attacks with weapons of mass destruction and disruption (WMDD)—nuclear, biological, radiological, chemical, and cyber. Founded in 2001 by former U.S. Senator Sam Nunn and philanthropist Ted Turner who continue to serve as co-chairs, NTI is guided by a prestigious, international board of directors. Ernest J. Moniz serves as chief executive officer and co-chair; Des Browne is vice chair; and Joan Rohlfing serves as president.

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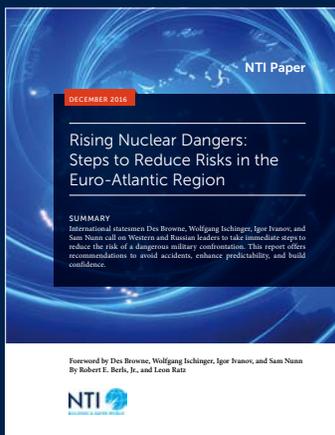


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