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Meeting U.S. Deterrence Requirements

Toward a Sustainable National Consensus

A WORKING GROUP REPORT

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— Robert Einhorn and Steven Pifer

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Introductory Note

Over the past 24 months, the Brookings Institution has convened a group of prominent Americans with deep experience in matters of nuclear weapons policy, regional security affairs, and/or arms control questions to examine recent disturbing international security developments and consider their implications for U.S. policies aimed at deterring potential adversaries and assuring U.S. allies and other security partners. This report is based on the group's deliberations. It is an effort to identify the main elements of a sound and sustainable national consensus on deterrence issues. On most critical policy questions, the group was able to reach agreement. Given the diversity of group members, it is not surprising that differences emerged on several important matters, in which case we noted the diverging points of view and explained the positions of both sides. Nonetheless, all signatories of the report (listed in Annex 1) endorse its overall thrust, although they do not necessarily support each and every one of its specific findings or recommendations. Members of the group wishing to provide their own perspectives on some key issues have done so in Annex 2. All group members hope that, as the Trump administration proceeds with its policy reviews, this report will make a worthwhile contribution to the national debate on U.S. deterrence requirements.

Executive Summary

In conducting its Nuclear Posture Review, the Trump administration needs to consider how best to meet U.S. deterrence requirements in a changing security environment. Today's most pressing challenges to U.S. deterrence goals come not from the threat of a massive nuclear attack against the U.S. homeland but from the possibility that nuclear-armed adversaries will use the threat of escalation to the nuclear level to act more aggressively in their regions and prevent the United States from coming to the defense of its allies and partners.

A key priority must therefore be to reinforce deterrence at the regional level. That will require strengthening U.S. and allied conventional military capabilities, ensuring the credibility of the forward-deployed and -deployable components of the U.S. extended nuclear deterrent, and maintaining the solidarity and resolve of U.S. alliances. It will also require modernizing U.S. central strategic systems and supporting infrastructure, which remain the bedrock of U.S. deterrence policy, both in extending deterrence and providing assurance to U.S. allies, and in deterring direct attacks on the American homeland.

Deterring Russia

A key concern is that Russia might exploit its local conventional military advantage in the Baltic region by engaging in aggression against a NATO ally and then threaten or employ limited nuclear strikes to compel NATO to back down and allow Moscow to consolidate the gains of its aggression. The United States and its NATO allies should continue to augment their forward conventional military presence; reinforce their extended nuclear deterrent by completing the B61-12 life extension program and replacing current dual-capable aircraft (DCA) over the next decade with F-35s; and give non-basing countries a greater role in the nuclear deterrence mission. In the European context, they should also seek a dialogue with Russia aimed at reducing tensions and avoiding dangerous incidents and miscalculations. At the global level, the United States should pursue wide-ranging "strategic stability talks" with Russia.

Deterring North Korea

North Korea (the Democratic People's Republic of Korea, or DPRK) poses the most acute near-term threat to the United States and its Asian allies. Washington and its Asian partners should strengthen conventional deterrence; reduce the coercive value of the DPRK's missiles through integrated regional missile defense and conventional strike capabilities; and ensure the credibility of extended nuclear deterrence through a combination of U.S. central strategic systems and U.S. forward-deployable DCA, perhaps deploying the latter more persistently or permanently in South Korea (but not stationing U.S. nuclear weapons there). In a crisis, Washington should reduce Pyongyang's incentives to initiate the use of nuclear weapons, signaling that North Korean restraint would be reciprocated, but that DPRK escalation would have grave implications for regime survival.

Deterring China

The principal challenge to U.S. and allied interests comes not from China's nuclear programs but from a major buildup of its conventional forces aimed at eroding U.S. conventional military superiority in the Western Pacific. The United States should maintain a strong conventional military presence in the region, enhancing its capabilities to operate in a more challenging "anti-access, area denial" environment. Although China will inevitably have an assured nuclear retaliatory capability, the United States can preserve the credibility of its extended nuclear deterrent by maintaining key quantitative and qualitative advantages vis-à-vis China in the strategic area. The combination of modernized U.S. central strategic systems and forward-deployable DCA can provide such an edge, augmented if necessary by more regular regional deployments of U.S. strategic assets (though

without nuclear weapons). While taking steps to reinforce deterrence, the United States should seek to dispel Chinese concerns that its programs are aimed at negating China's nuclear deterrent. China has so far resisted a meaningful U.S.-China dialogue aimed at promoting a more stable strategic relationship and reducing mutual mistrust and worst-case planning, but the Trump administration should seek to establish such a dialogue.

Deterring Iran

The United States should seek to preserve the Joint Comprehensive Plan of Action (JCPOA) by strictly enforcing Iranian compliance and meeting its sanctions relief commitments so that Tehran receives the benefits to which it is entitled. It should also seek to dissuade Tehran from pursuing a large-scale enrichment capacity when the agreement's nuclear restrictions expire after 15 years. At a minimum, the United States and its partners should press Iran to defer the expiration dates for several years, perhaps offering to address Iran's concerns about remaining U.S. sanctions in return for longer-lasting nuclear restrictions. But if Iran is unwilling to forgo or defer a large enrichment program, the U.S. president, with the support of Congress, could declare that it is the policy of the United States to prevent Iran from acquiring nuclear weapons, if necessary with the use of military force.

Nuclear Terrorism

Preventing and deterring nuclear terrorism must remain a top national security priority, including by countering the terrorists themselves; denying access to nuclear weapons, technologies, and materials; holding accountable any entity facilitating nuclear terrorism; and strengthening homeland security.

Modernization

With all legs of the Nuclear Triad approaching the end of their expected service lives, it is essential to proceed with modernization. Some signatories believe that, especially given the high cost of recapitalizing the Triad, U.S. deterrence requirements could be met with fewer deployed systems than envisaged in the current "program of record," which includes 12 Columbia-class ballistic missile submarines (SSBNs), 400 deployed intercontinental ballistic missiles (ICBMs), and 80-100 B-21 bombers, and that modernization of the ICBM leg could be deferred or not pursued at all. However, other members of the group believe the current plan for modernizing each leg of the Triad should be implemented and that the costs of modernization, given the high priority of deterrence, are affordable. Indeed, some members believe that planned numbers may not be adequate if the security environment continues to erode.

Plans for modernizing nuclear command, control, and communications systems as well as the nuclear weapons industrial complex should be expeditiously implemented. So should the strategic plan for the nuclear weapons stockpile, including the completion of warhead life extension programs and the "3+2" strategy for transitioning from 11 to five warhead types. While new nuclear weapons are not necessary, most members of our group believe that, in order to sustain necessary technical expertise, U.S. weapons laboratories should be allowed to explore alternative design concepts and build prototypes of some designs, so long as this is done without nuclear testing, without introducing new designs into the stockpile, and without devising new missions for nuclear weapons. Some others believe this would contravene the Obama administration's policy not to pursue new nuclear weapons.

Members of the group also differ on a few other modernization issues. For example, supporters of the Long Range Stand-Off (LRSO) air-launched cruise missile maintain that proceeding on schedule with the LRSO is necessary to avoid a gap in air-delivered deterrence capabilities, while critics argue that the LRSO is redundant given the penetrating capability of the B-21 and can be deferred until risks to bomber penetration justify a stand-off weapon.

Proponents of restoring the nuclear capability of the Tomahawk sea-based cruise missile (Tomahawk land-attack missile, nuclear, or TLAM-N) contend that it would bolster extended deterrence and assurance in both Europe and Asia, whereas opponents assert that it is not needed for extended deterrence and that reviving a system retired a decade ago would be viewed domestically and internationally as a step backward.

Nuclear Weapons Employment Policies

Although the likelihood that the United States would use nuclear weapons in response to a non-nuclear attack is very limited, formally adopting a "sole purpose" or "no first use" policy could erode confidence on the part of some U.S. allies in the U.S. extended deterrent and should not be pursued under current circumstances.

While an adversary's strategic and other military-related assets should remain a central part of the target base held at risk by U.S. forces, the administration should consider whether including a limited number of high-leverage infrastructure sites (e.g., electricity generation, communications nodes) in the target mix—and holding them at risk with precision-guided conventional strike weapons to minimize collateral civilian damage—would strengthen deterrence by threatening disruptive outcomes that today's leaders of potential adversary countries would regard as unacceptable.

Members of the group believe that, in the current security environment, changes in the alert status of the Triad are not warranted. At the same time, some members maintain that the United States should adopt a policy that, in the event early warning sensors detect a possible massive nuclear attack, the planning assumption would be that the president would wait for a confirmed nuclear detonation before ordering a nuclear response. They believe that moving to a policy of confirmed detonation—and not executing the option to "launch under attack" (LUA)—would give the president more time to make such a fateful decision and to eliminate the risk, however small, of a catastrophic false alarm. Other members would retain the current approach toward LUA, arguing that deterrence is strengthened if a potential attacker believes the U.S. president may launch U.S. ICBMs if an attack is underway and that effective warning systems and layers of technical and procedural safeguards essentially rule out false alarms.

On force levels, the signatories believe U.S. deterrence requirements can be met with a properly designed force structure at a level of roughly 1,000 deployed strategic warheads, assuming that the New Strategic Arms Reduction Treaty (New START) remains in effect, that New START counting rules are used for bomber weapons, and that the Russians join in reducing to that level. Any change in the number of U.S. nuclear weapons deployed in Europe should depend on the evolution of the threat from Russia and agreement among NATO members. Implementation of current plans to modernize the Department of Energy's nuclear weapons complex will reduce the number of non-deployed nuclear weapons required as a technical or geopolitical hedge. And although conventional systems inherently lack the deterrent value of nuclear weapons and cannot fully substitute for them, integrating non-nuclear systems into U.S. deterrent planning could reduce the number of nuclear weapons required.

Missile Defense

In the congressionally mandated review of U.S. missile defense policy, the administration should reaffirm the goal of a limited homeland missile defense and should not seek the capability to protect U.S. territory against the large-scale attacks that Russia and increasingly China are capable of mounting. At the same time, in light of advances in DPRK missile programs, the administration should consider how best to further upgrade homeland defenses against a North Korean attack, including by increasing the number of Ground-Based Interceptors (GBIs) accompanied by demonstrated improvements in GBI reliability and strengthened sensor capabilities.

On regional missile defenses, the United States should work with South Korea and Japan on a regional missile defense against North Korea, and U.S.-Japanese missile defense cooperation should seek to protect Japan and U.S. forces there against small-scale Chinese missile attacks. In Europe, the United States should complete the Polish site for SM-3 missile interceptors but consideration should be given to not making the site operational if Iran suspends the flight testing of missiles capable of striking Europe. Washington and its NATO allies should also pursue a limited theater defense mission that would seek to protect NATO's power projection capabilities against Russian ballistic and cruise missiles.

Arms Control

With the near-term outlook bleak for additional formal U.S.-Russian agreements, early priority should be given to conducting strategic stability talks aimed at addressing each other's strategic concerns as well as to extending New START for five years beyond its scheduled expiration in 2021.

As regards the Intermediate-Range Nuclear Forces (INF) Treaty, the United States should make a proposal that would verifiably ban the deployment of Russian's INF-prohibited cruise missiles and address Moscow's concerns about U.S. compliance, while taking steps, such as deploying additional air and sea conventional capabilities, to demonstrate that the Russian violation will not go unanswered. In the event Russia rejects such a proposal and continues its non-compliance with the INF Treaty, the United States and its allies should sustain and, if necessary, augment those steps. To address Russia's advantage in non-strategic nuclear weapons in the absence of formal measures, Washington should pursue confidence-building arrangements (e.g., no deployment of U.S. weapons in "new" NATO members, no Russian deployment within a certain range of NATO territory). Moreover, the administration should propose a U.S.-Russian executive agreement on missile defense transparency in which the two sides would exchange annual declarations providing the number of key missile defense elements (e.g., interceptors and radars) they currently possess and projecting those numbers for each year over the following 10 years.

The Treaty on the Prohibition of Nuclear Weapons, adopted on July 7, 2017, with the vote of 122 countries, will enter into force when 50 countries have ratified it. Given the opposition of all the nuclear-armed states as well as countries that rely on the United States for extended deterrence, the treaty will not advance its goal of accelerating nuclear disarmament. The United States should continue to oppose the treaty, making clear that it cannot establish new "customary" international law, ensuring that it does not in any way undermine or replace the Nuclear Non-Proliferation Treaty (NPT) as the established global non-proliferation regime, and countering attempts to use the ban to undermine support for burden-sharing and extended deterrence in Western democracies. At the same time, it should engage with "ban treaty" proponents with a view to ensuring that differences over the treaty do not adversely affect prospects for the 2020 NPT Review Conference.

With no currently foreseeable need to test nuclear weapons, the administration should continue the U.S. 25-year testing moratorium and join other avowed testing powers (other than the DPRK) in a joint political commitment to refrain from testing for at least 10 more years.

The administration should reaffirm the ultimate goal of a world without nuclear weapons. While conditions for achieving that goal are unlikely to exist for the foreseeable future, renouncing it would needlessly damage the U.S. ability to play a worldwide leadership role in reducing nuclear dangers.

Sustaining Consensus

U.S. deterrence policies and plans must be sustainable over the long term and therefore must achieve and maintain a bipartisan national consensus, including in support of the funding needed

for modernization in coming decades. The Trump administration should therefore pursue a balanced approach that has wide appeal across the political spectrum—one that combines a strong commitment to ensure modern, effective deterrence at both the regional and global levels with a continuing commitment to promote stability and reduce nuclear dangers through dialogue and further arms control efforts.

CHAPTER 1

The Challenges to U.S. Deterrence

The signatories of this report see a need to think afresh about how best to meet U.S. deterrence requirements in a changing security environment. While members of the group differ on some specific issues as detailed in the report, they share a commitment to ensuring stable deterrence and reducing nuclear dangers as essential goals of U.S. policy.

The international security environment in which the Trump administration is conducting its Nuclear Posture Review (NPR) has changed significantly, and for the worse, from the relatively stable and benign conditions that prevailed for much of the post-Cold War period. Indeed, it has deteriorated sharply since the 2010 NPR, the conclusion of the New Strategic Arms Reduction Treaty (New START), and President Obama's "Prague agenda."

Potential adversaries Russia, North Korea, and China are challenging the status quo and rules-based international order, significantly improving their nuclear forces, seeking to match or offset U.S. conventional military advantages, and threatening U.S. allies. In general, they seek to undermine U.S. power and influence in their neighborhoods. These efforts pose particular challenges to the continuing credibility of the U.S. extended nuclear deterrent.

Strategic threats to the United States are not confined to the prospect of nuclear attack against the U.S. homeland or U.S. security partners. They now include threats posed by a range of conventional and non-kinetic disruptive technologies to U.S. space assets, cyber networks, and power projection capabilities. Although the likelihood of a massive surprise nuclear attack against the United States is exceedingly remote, the possibility that an adversary will decide to initiate the use of nuclear weapons in a regional conflict—by design or as the result of miscalculation—may be increasing.

The United States has many instruments of national power to address these threats: military (nuclear, conventional, and non-kinetic weapons); political (bilateral and multilateral diplomacy, alliances, and other security partnerships); and economic (including sanctions and other forms of pressure). While all of these instruments play a role in deterring or responding to hostile behavior toward the United States and its allies—and more systematic thinking should be devoted to understanding how they can best complement one another to advance U.S. interests—this report focuses primarily on the role of military instruments and alliance relationships in deterring potential adversaries and assuring U.S. partners.

Despite worrisome changes in the security environment, there are many elements of continuity in U.S. nuclear policy that should carry forward into the 2017 NPR and beyond. In particular, U.S. strategic goals have not changed. U.S. policy still seeks to deter coercion and aggression against the United States; deter coercion and aggression against—and also assure—U.S. allies and other security partners; reduce the risk of armed conflict, especially nuclear war (whether by design, accident, or miscalculation); strengthen strategic stability with peer competitors Russia and China; prevent further nuclear proliferation and weapons of mass destruction (WMD)

terrorism; and preserve an international order that upholds such norms as respect for state sovereignty and territorial integrity, the resolution of disputes by peaceful means, and freedom of navigation and overflight. To promote these goals in the current international environment, the Trump administration will need to consider what adjustments in the existing U.S. strategic posture are warranted—and which ones are not.

Additionally, the signatories of this report see no U.S. interest in reviving the Cold War or embarking on conventional or nuclear arms races. The signatories want instead to return to more stable and less confrontational strategic relationships with Moscow and Beijing in which further arms control and other stabilizing measures aimed at reducing nuclear dangers can be pursued. But getting back on a more constructive track will require the United States and its alliance partners to demonstrate that they have both the will and the capabilities to deter and thwart any aggressive actions; it will also require changes in approach on the parts of Moscow and Beijing.

With the incorporation of strategically important non-nuclear technologies such as missile defenses and precision-guided conventional strike weapons, the centrality of nuclear weapons in the U.S. deterrence architecture has declined sharply since the Cold War. But continuing to reduce the salience of nuclear weapons will be difficult if a competitor such as Russia is increasing its reliance on nuclear weapons.

The signatories also support the eventual elimination of nuclear weapons globally, a goal adopted by previous Republican and Democratic administrations. But conditions for achieving that goal do not currently exist and would require major changes in the global environment over a significant period of time. Unfortunately, a world without nuclear weapons seems farther away today than it did at the time of President Obama's Prague speech. The United States should continue to work toward the realization of conditions that would make the worldwide elimination of nuclear weapons possible. However, the U.S. government cannot make decisions about the maintenance and modernization of U.S. nuclear capabilities and infrastructure in the expectation that nuclear weapons will be eliminated in a predictable timeframe.

The main task of U.S. deterrence policy during the Cold War was to deter a Soviet nuclear or massive conventional attack. Deterring other potential adversaries received much lower priority, and the capabilities required for deterring them were assumed to be covered by the capabilities needed to deter Moscow. As recognized by previous administrations, a "one size fits all" policy does not work. The deterrence challenges posed by Russia, North Korea, China, and potentially Iran require individually tailored responses that include all forms of American political and military power. That said, a U.S. nuclear force adequate to deter Russian military aggression against U.S. allies and the United States should contain the components needed to deter other possible adversaries. And the size and shape of that force needs to reflect the multiple demands of deterrence, assurance, and strategic stability, as well as the need to hedge against uncertainties in both the security and technological environments.

During the Cold War and for much of the post-Cold War period, the task of ensuring effective deterrence fell heavily on the U.S. Triad of nuclear weapons delivery systems—intercontinental ballistic missiles (ICBMs), submarine-launched ballistic missiles (SLBMs) on ballistic missile-carrying submarines (SSBNs), and strategic bombers. These central strategic systems continue to play an essential role in preventing war and escalation, including escalation to the nuclear level from conventional regional conflicts or direct nuclear attacks on the U.S. homeland, allies, or deployed U.S. forces. Modernization of U.S. central systems as well as the nuclear command-and-control and infrastructure that support them is essential.

In modernizing that force, however, it is important to bear in mind that the principal challenges to deterrence today occur at the regional level—in

Central and Eastern Europe, Northeast Asia, and the Western Pacific. Conventional aggression is overwhelmingly the most likely initiator of the use of nuclear weapons. It follows that shoring up deterrence in these regions will rely heavily on enhancements in conventional capabilities, including missile defenses, non-nuclear offensive strike systems, and non-kinetic tools—as well as on modernization of the Triad. It will also require steps to reinforce the credibility of the U.S. extended nuclear deterrent as well as close cooperation with U.S. regional allies and other security partners. Moreover, strengthening the "software" of deterrence (e.g., firm and consistent declaratory policies, alliance solidarity and resolve, exercises involving deterrence plans, visible demonstrations of military capabilities, reliable funding support, and political consensus) will be as important as upgrading the "hardware" of deterrence (i.e., the military programs and capabilities).

Given the importance of reinforcing deterrence at the regional level, we first turn to key regional challenges. We then address issues affecting central deterrence, including the future of the Triad and related systems, force levels, nuclear weapons employment policies, missile defenses, and arms control.

Deterring Russia in Central and Eastern Europe

Today the principal deterrence priority with respect to Russia is countering the threat Moscow poses to Central and Eastern Europe, especially to U.S. NATO allies in the Baltics and Poland. In seizing Crimea and continuing to support violent separatism in eastern Ukraine, Russia has demonstrated its readiness to use military force to violate international norms and obligations to upend the post-Cold War status quo. It has carried out an increasing number of provocative military exercises, including some involving simulated nuclear strikes against U.S. allies; built up its military forces opposite NATO territory; deployed cruise missiles prohibited by the 1987 Intermediate-Range Nuclear Forces (INF) Treaty; repeatedly violated NATO airspace and engaged in dangerous encounters with NATO ships and aircraft; modernized its central strategic and non-strategic (tactical) nuclear forces; beefed up military capabilities intended to impede NATO's ability to reinforce front-line allies in a crisis; and conducted a massive propaganda and information warfare effort, including implicit and not-so-implicit nuclear threats, aimed at intimidating NATO countries and influencing their domestic affairs.

Russia's public doctrine on the use of nuclear weapons might be read as relatively benign. It says Moscow would respond with nuclear arms to an attack with nuclear or other weapons of mass destruction on Russia or a Russian ally, or in the event of a conventional attack on Russia in which the existence of the Russian state was at stake. However, Russian officials have discussed what has been called an "escalate to de-escalate" strategy in which Russia would threaten or initiate a limited nuclear strike in the midst of a conventional armed conflict—including when Russian forces had initiated conventional hostilities and the existence of the Russian state was not at stake—to shatter NATO's unity, deny the United States the means to reinforce Europe, and compel the Western alliance to back down and allow Moscow to consolidate the gains of its conventional aggression.[1] There are also disturbing signs that Russia's most senior leaders no longer appreciate that, as Presidents Reagan and Gorbachev declared, a nuclear war cannot be won and must never be fought.

We do not know what truly motivates Vladimir Putin and the Kremlin's more assertive, nuclear-centric actions and rhetoric—whether the Kremlin actually intends, through covert or overt means, to threaten the territory of NATO members, or whether its saber-rattling is essentially posturing designed to deter

[1] Unofficial Russian experts strongly deny that "escalate to de-escalate" has been incorporated into official Russian doctrine, but planners at the Pentagon and NATO headquarters are adjusting U.S. and NATO nuclear policy to take account of it. Contributing to concerns about Russian policy were remarks by President Putin suggesting that he would have threatened the use of nuclear weapons if Moscow's seizure of Crimea had been seriously threatened.

what it sees as further Western efforts to encroach on Russian interests. We also do not know whether Russia would actually use nuclear weapons first during a conventional conflict or whether instead it appreciates the tremendous risks of initiating the use of nuclear weapons and is signaling a willingness to escalate to the nuclear level mainly for the purpose of undermining NATO unity and resolve to contest aggressive Russian actions in a crisis.

Whatever Russia's intentions may be, we have to take its provocative words and actions seriously. Proximity to NATO territory provides Russia certain inherent conventional force advantages at the local level, particularly in the Baltic region. NATO should, therefore, continue to strengthen the conventional deterrence and defense capabilities on its eastern front to ensure that Moscow cannot attack alliance members and expect to achieve a rapid, low-cost *fait accompli.* The alliance should also ensure that it has the capabilities to operate in a more challenging anti-access, area-denial environment and expeditiously reinforce the position of exposed allies in a crisis. The United States and its NATO allies must also disabuse Russia of any expectation that it could initiate the use of nuclear weapons without running unacceptable risks. Indeed, a serious potential source of instability today is that the Kremlin may underestimate the unity, resolve, and preparedness of NATO to resist intimidation and nuclear coercion. Through its own declaratory policy and military posture, the United States and the alliance must seek to prevent any such miscalculation, including by making clear to Russian leaders that any first use of nuclear weapons, even on a scale intended to be limited, would breach a threshold that has not been crossed for 70 years, opening a Pandora's box of unpredictable and potentially catastrophic consequences.

Much of the conventional and nuclear capabilities needed to deter Russia in Eastern Europe are already in train and can be built upon as necessary. At the 2014 Wales summit and the 2016 Warsaw summit—and with the strong support of the European Reassurance Initiative—NATO has enhanced its conventional capabilities. It has increased its forward military presence by deploying on a rotational basis battalion-sized task groups in each of the Baltic states and Poland; strengthened its capacity to quickly reinforce its eastern flank; stepped up military exercises; raised readiness levels; improved cyber defenses; and begun to develop a strategy to counter Russian disinformation campaigns and "hybrid warfare" threats. NATO needs to follow through with these enhancements, which would be given a boost if all members met their defense spending targets of two percent of GDP by 2024, a goal which they reaffirmed at the Wales summit.

At the Warsaw summit, NATO reinforced its commitment to nuclear deterrence, issuing a warning that "any employment of nuclear weapons against NATO would fundamentally alter the nature of a conflict. … If the fundamental security of any of its members were to be threatened …, NATO has the capabilities and resolve to impose costs on an adversary that would be unacceptable and far outweigh the benefits that an adversary could hope to achieve."[2]

Current U.S. and NATO plans for ensuring effective nuclear deterrence—relying on U.S. strategic forces and a limited European-based U.S. nuclear presence—appear sufficient, at least for now. However, some members of the group recommend exploring ways of reinforcing the nuclear deterrent, including by restoring the nuclear capability of the Tomahawk land-attack cruise missile for both European and East Asian contingencies (see discussion below), developing a nuclear version of the Joint Air-to-Surface Standoff Missile (JASSM), or deploying low-yield, primary-only warheads on U.S. ICBMs or SLBMs. Other members of the group oppose such ideas as unnecessary to ensure deterrence and assurance in Europe, particularly if NATO bolsters its conventional deterrence and defense capabilities. All agree

[2] "Warsaw Summit Communique," North Atlantic Treaty Organization, July 9, 2016, para. 54, http://www.nato.int/cps/en/natohq/official_texts_133169.htm.

there is no need to emulate Russia's theater nuclear posture in scale or mission.

Whatever its military utility, the presence in Europe of U.S. nuclear weapons deliverable by U.S. and allied aircraft remains a key element of the U.S. commitment to NATO. Accordingly, the alliance's dual-capable aircraft (DCA) need to be modernized over the course of the next decade, with the dual-capable F-35 Joint Strike Fighter eventually becoming the backbone of NATO's theater-based deterrent capability. The signatories encourage NATO basing countries to continue in that role and upgrade their DCA as soon as possible.

The United States should complete the life extension program for the B61 nuclear weapon by 2024, as scheduled. With its accuracy, reliability, and low-yield option, the B61-12 and its F-35 delivery platform will provide a credible and discriminate capability to complement the fundamental role of U.S. central strategic systems in dissuading Russia from thinking it could initiate the use of nuclear weapons without triggering a devastating Western response. NATO also needs to upgrade its nuclear command-and-control capability. Although there is no need to deploy nuclear weapons or DCA on the territory of the newer NATO members, non-basing countries could be given a greater role in the nuclear deterrence mission in order to reinforce alliance solidarity and burden-sharing.

NATO's three nuclear-armed members—the United States, Britain, and France—must all ensure that their forces are capable of fulfilling their commitments. As the current NATO strategic concept attests, these forces are the ultimate guarantee of the sovereignty and security of alliance members. The United States and United Kingdom, and to an increasing extent France, have accepted responsibilities for their strategic forces in supporting the alliance's deterrence strategy, and the allies should continue to cooperate toward that end.

Notably, NATO's deterrence and defense posture includes not just conventional forces and nuclear forces; it also includes cyber and space capabilities. There is also an open question (discussed later in this report) of whether and how NATO's missile defense posture should adapt to new capabilities fielded by Russia, including especially cruise missiles. All of these capabilities are a complement to NATO's nuclear deterrent, not a substitute—but they will be required to make an increasing contribution to NATO's deterrence and defense strategy.

While shoring up deterrence of "gray zone," conventional, and nuclear aggression in Central and Eastern Europe is the most pressing alliance priority, the United States and its NATO allies should also look for ways to reduce tensions, strengthen stability, and avoid dangerous incidents and miscalculations. In addition to proceeding with U.S.-Russian strategic stability talks (discussed below) and resuming bilateral military-to-military contacts, NATO allies should seek to pursue a wide-ranging dialogue with Russia in which they could press Moscow to address Western concerns about provocative Russian activities, exercises, and deployments. At the same time, the allies could seek to alleviate Russian concerns that NATO's enhanced forward presence would be used for offensive operations. The two sides should review and upgrade existing arrangements regarding the notification and observation of military exercises, the avoidance of dangerous military incidents at sea, in the air, and on land, military-to-military engagement, and communications in a crisis. Russia's willingness to faithfully implement the Minsk II agreement regarding a settlement of the Ukraine-Russia conflict in Donbas and cease undermining Ukrainian sovereignty, something not in evidence as of August 2017, would go a long way to reduce current tensions and rebuild confidence.

Deterring North Korea

While the size and sophistication of Russia's conventional and nuclear forces make it the most formidable threat now faced by the United States, North Korea—with the accelerated pace of its nuclear and missile programs, its paranoia about U.S. intentions,

its declared readiness to initiate the use of nuclear weapons, and the unpredictability of its behavior in a crisis—poses the most acute, near-term threat to the United States and its Asian allies.

North Korea can already attack South Korea and Japan with nuclear weapons. It also has the capability to target U.S. forces and bases in the region, including Guam—a capability apparently designed to disrupt U.S. plans to flow massive reinforcements to the Korean Peninsula in the event of a crisis. With its July 2017 flight tests of two ICBM-range missiles and its sixth and most powerful nuclear test so far on September 3, 2017, it took important steps toward acquiring the capability to strike the U.S. homeland with nuclear-armed missiles, which it presumably hopes will deter the United States from coming to the defense of its Asian allies or otherwise pursuing a policy of regime change. By developing solid-fueled missiles for deployment on mobile, land-based launchers and submarines, the North Koreans are seeking to deny the United States and its allies the ability to target and destroy their nuclear deterrent. Aside from the nuclear threat, North Korea has long had the capability to inflict massive damage on South Korea from conventionally armed artillery and rocket systems deployed within range of Seoul.

North Korea's intentions are even less knowable than Russia's intentions. Despite the fiery rhetoric, Pyongyang may see its nuclear capability in largely defensive terms, as ensuring the survival of the regime by deterring attempts by the United States and its allies to attack or otherwise undermine it. Or it may see its nuclear forces as serving a more aggressive, revisionist agenda consistent with the regime's long-declared goal of reunifying the Peninsula.

Whatever the North's original motivations for acquiring nuclear weapons may have been, there is a risk that its growing nuclear capabilities will give its leadership greater confidence to engage in provocative activities against South Korea at the conventional or sub-conventional level. Pyongyang may calculate that its threats to initiate the use of nuclear weapons would inhibit U.S. and allied responses to such provocations. It may even believe that, in the event of a conventional military confrontation on the Peninsula, it could conduct limited nuclear strikes aimed at compelling the United States and its allies to back down and terminate hostilities before the survival of its regime would be jeopardized.

Unlike in the case of Russia and China, the United States does not accept the legitimacy of North Korea's nuclear weapons capability, which Pyongyang acquired by violating its obligations as a party to the 1970 Nuclear Non-Proliferation Treaty (NPT). The U.S. goal remains the complete and verifiable denuclearization of North Korea.

But as long as North Korea (the Democratic People's Republic of Korea, or DPRK) retains nuclear weapons, the United States and its allies must seek to deter North Korean coercion or aggression at both at the conventional and nuclear levels and reduce the risks of miscalculation or escalated conflict that could result in the use of nuclear weapons. The United States needs to maintain the solidarity of its alliances with South Korea (the Republic of Korea, or ROK) and Japan, work with other partners in the U.N. Security Council and elsewhere to promote stability on the Peninsula, deny North Korea the prospect of conventional military gains, ensure the continued reliability and effectiveness of the U.S. extended deterrent, and pursue together with its Northeast Asian allies both missile defense and conventional strike capabilities that can protect U.S. and allied territory against North Korean missile attack. North Korean leader Kim Jong Un must fully understand that any use of nuclear weapons against the United States or its allies would be met with a response that, in the words of Secretary of Defense Jim Mattis (and Secretary of Defense Ash Carter before him), would be "effective and overwhelming."

The United States and ROK should continue to bolster conventional deterrence through further enhancement of South Korean military capabilities, including improved missile defenses and new conventional strike capabilities. A continued strong U.S. military presence in the region and on the Peninsula

(including necessary prepositioning of equipment and a credible ability to reinforce Peninsula-based forces in a crisis) is essential, as are robust joint military exercises. The allies also need to strengthen the resilience of their cyber networks against North Korean threats in that domain.

These military capabilities must be reinforced with clear statements of U.S. presidential intent. Each new president must express in his own way his commitment to defend U.S. allies, including especially when their most vital interests are at risk and the possibility of U.S. nuclear employment comes to the fore. Policy positions in the Nuclear Posture Review and elsewhere lay the foundation, but are much more powerful when amplified by presidential statements.

A major effort should be made to reduce the coercive value of DPRK missile capabilities and the vulnerability of allied forces and populations to North Korean missile attack, whether conventional, nuclear, or chemical/biological. This involves working with South Korea and Japan on further developing a regional missile defense that includes additional Patriot missile batteries against short-range threats, Terminal High Altitude Area Defense (THAAD) batteries in Guam and South Korea (and perhaps Japan), Standard Missile-3 (SM-3) missile interceptors aboard Aegis-equipped warships, finalizing development of a new interceptor (SM-3 IIA) with Japan and proceeding to field this system in regional defenses, and an upgraded capability to defend the U.S. homeland against North Korean attack (discussed later in this report).

The allies should also pursue conventional strike capabilities that could be used to pre-empt an imminent North Korean missile attack or to respond to DPRK missile strikes by seeking to destroy North Korea's launch capabilities before Pyongyang can mount follow-on attacks. Given the challenge posed by the growing mobility of North Korean missile forces, this will require significantly enhanced intelligence, surveillance, target acquisition, and reconnaissance capabilities as well as offensive cyber tools able to disrupt North Korean missile operations. U.S. conventional precision strike systems in the region should be augmented, including by deploying a number of Virginia-class attack submarines with a new payload module (the "Virginia payload module") capable of carrying conventionally-armed cruise missiles. The United States should also consider whether it should field more prompt conventionally-armed strike systems with ranges and in numbers tailored to credibly threaten regional challengers like North Korea.

The United States should work with the ROK and Japan to ensure the credibility of the U.S. extended nuclear deterrent to prevent North Korea from miscalculating alliance resolve. Its credibility is also required to assure America's allies that they can rely on the U.S. security guarantee and need not pursue their own nuclear weapons capabilities. U.S. central strategic systems, together with U.S. nuclear-capable fighter-bombers (currently F-15Es, F-16s, and eventually F-35s) that can be deployed to allied territory, continue to constitute an effective nuclear umbrella. U.S. nuclear weapons need not be stationed on the Peninsula, but exercising the capability to rapidly deploy them forward in a crisis would contribute to the credibility of the deterrent. Such exercises would not involve actual nuclear weapons. At present, U.S. DCA are deployed in South Korea on a rotational basis, but as the situation evolves, consideration could be given to more persistent or permanent stationing. Continued regular deployment in Guam of nuclear-capable B-52Hs and B-2s signal the critical role of U.S. strategic systems in maintaining the extended deterrent.

In addition to public, high-level reaffirmations of U.S. commitment and tangible demonstrations of U.S. resolve (e.g., flyovers by U.S. strategic bombers, patrols by U.S. Navy strike groups), the administration should be responsive to the desire of the South Koreans and Japanese—as expressed in senior-level bilateral consultations with the United States—to play a more prominent role in ensuring the effectiveness of the U.S. extended nuclear deterrent. Although NATO-type burden-sharing arrangements are neither necessary nor suitable in the Northeast

Asian context, significant involvement of the allies in the development of mechanisms for nuclear consultation in a crisis, the development of concepts to guide escalation and war termination, and broader integration of military operational planning outside the nuclear realm (e.g., regional missile defense operations) would be warranted.

North Korea's prioritization of regime survival above all else and its unfounded suspicion of U.S. intentions pose a unique challenge for U.S. deterrence policy. A North Korean leadership that fears that a conventional military conflict with the United States or a disarming conventional or nuclear attack by the United States could end its regime may decide in a crisis to use nuclear weapons first and run the risk of a devastating U.S. response if it figures that nuclear escalation is its only means of getting the United States and its allies to stand down, thus staving off a mortal threat to the regime. Therefore, in conducting joint military exercises with allies or pursuing military programs that the North Koreans could interpret as threatening the survival of their regime (e.g., prompt strike capabilities), the United States and its allies should seek to convey the essentially defensive nature of their actions and avoid gratuitously arousing DPRK concerns about their intentions (e.g., by talking about "decapitation"). In a crisis situation, it would be critical to signal clearly to the North that its best hope of averting regime change is to exercise restraint, that North Korean restraint would be reciprocated by the United States, and that North Korean escalation, especially to the nuclear level, would have grave consequences for the regime in Pyongyang.

The administration should give high priority to seeking to persuade North Korea, through strong international pressures and engagement, to abandon its threatening nuclear and missile programs. There is no military solution to the North Korean challenge that can be achieved without running intolerable risks. Diplomacy is essential. But any prospect of an acceptable negotiated solution will depend on China's willingness to bring to bear much greater pressure on Pyongyang than it has been prepared to exert so far, and that will require U.S. readiness to penalize Chinese entities that are facilitating DPRK nuclear and missile programs in violation of U.N. Security Council sanctions. It will also require the United States and its Northeast Asian allies to support an approach to negotiations—perhaps along the lines of the phased approach to denuclearization advanced by South Korean President Moon Jae-in—that provides reasonable incentives to induce the North to accept their requirements. But if North Korea is not prepared to negotiate seriously and insists on retaining and expanding its destabilizing capabilities, the United States and its allies would have little choice but to pursue a long-term strategy of deterrence and containment. In that event, determined efforts by the United States, South Korea, and Japan to strengthen their deterrent posture—including through significantly greater trilateral defense cooperation—would be crucial in sustaining such a strategy and defending their interests in the period ahead.

Deterring China

China poses a less acute nuclear threat than either Russia or North Korea but a more serious, long-term geostrategic challenge. Unlike Moscow or Pyongyang, Beijing does not brandish its nuclear weapons or talk about initiating their use. The focus of its ambitious nuclear modernization program has mainly been to achieve a secure retaliatory capability (and thereby reduce what it sees as its vulnerability to U.S. nuclear coercion) and to sustain that capability in the face of developments in the U.S. defensive and offensive postures. The principal challenge to the interests of the United States and its East Asian allies comes not from China's nuclear programs but from a major buildup of its conventional forces, including its anti-access, area denial capabilities, aimed at eroding U.S. conventional military superiority in the Western Pacific and undermining the ability of the United States to provide security to its Asian allies. Beijing may believe that the combination of an assured second-strike nuclear capability and a robust conventional military posture will give

it a freer hand to pursue more assertive policies and expand its influence in the Asia-Pacific region.

Indeed, in recent years, China has acted more aggressively in the region. To contest Japan's claim to the Senkaku/Diaoyu islands in the East China Sea, Chinese fishing boats, "law enforcement" vessels, and aircraft have repeatedly engaged in provocative activities in waters and airspace surrounding the disputed islands administered by Tokyo. In addition, China declared an air defense identification zone over two-thirds of the East China Sea. It has engaged in a heavy-handed campaign, including through the use of economic penalties, aimed at coercing Seoul to reject the deployment in South Korea of the U.S. THAAD system. Perhaps most provocatively, Beijing asserted sovereignty over much of the South China Sea and, in defiance of the Permanent Court of Arbitration's rejection of its claims, has engaged in an active program of land reclamation and military construction in areas claimed by various Southeast Asian countries. Moreover, it has increased the frequency of exercises and patrols aimed at extending the reach of its naval and air forces beyond the first island chain into the Western Pacific.

China is working to become a major power in world affairs and in the Asia-Pacific region. The United States has sought a constructive and mutually beneficial relationship with Beijing and recognizes that as China's power grows, its influence will grow. The United States has no desire to impede or contain China's rise as long as it adheres to international norms and does not encroach on the interests of the United States and its allies and partners in the region.

At the same time, the United States is committed to defending its regional allies against Chinese intimidation or attack, preventing China from illegally controlling and impeding access to vital international maritime areas and airspace, and preserving the U.S. ability to project power in East Asia in support of U.S. and allied interests.

The main challenges currently posed by China are in the non-nuclear realm, and U.S. responses to ensure effective deterrence are also primarily in the non-nuclear realm. The United States should maintain a strong military presence in the region, including by keeping roughly 50,000 military personnel in Japan, conducting more frequent port visits and rotational air and naval deployments throughout the region, engaging in regular joint military exercises with key security partners, and perhaps permanently stationing additional air and naval assets, especially in Japan and Guam. The United States should also enhance its capabilities to operate in a more challenging anti-access, area denial environment and preserve or regain key conventional military advantages, including by adequately funding and implementing the application of advanced technologies to the new operational challenges in the new environment. Given China's demonstrated anti-satellite and cyber capabilities, Washington should also continue to ensure the resilience of its space assets and cyber networks and should explore additional means of deterring attacks on them. The Navy's freedom of navigation operations, especially in the South China Sea, should be pursued on a regular basis to underline that the United States does not recognize Beijing's illegal claims.

In seeking to discourage aggressive Chinese behavior, the United States should rely heavily on regional partners, especially Japan. Washington should continue to support Tokyo's intention to play a more active role in exercising its right of collective self-defense, including by assisting U.S. forces in regional contingencies, and it should cooperate with Japan in strengthening its advanced conventional defense capabilities, including missile defenses (if Japan seeks U.S. cooperation in acquiring THAAD or Aegis Ashore) and conventional strike missiles. President Obama's statement, reaffirmed by the Trump administration, that the U.S.-Japan security treaty applies to Japanese administration of the Senkaku Islands has been important both in reassuring Japan of the U.S. commitment and in raising the stakes for China of aggressively pressing its claims to the islands. The Trump administration should also continue to affirm the long-established U.S. position that any change in the relationship between Taiwan

and China must be accomplished by peaceful means and not the use of force.

The United States should also work with other Asian states, especially Australia, India, Vietnam, and—despite current bilateral difficulties—the Philippines. In some cases, that will involve helping to build the capacity of regional states to resist Chinese assertiveness. Efforts to prevent China's unwarranted control of key maritime areas will be more effective if supported by a broad coalition of regional stakeholders.

The nuclear realm historically has not been an area of serious U.S.-Chinese contention or competition, and the Trump administration should try to keep it that way. Washington recognizes that, given Beijing's political will, technological prowess, and financial resources, it cannot possibly deny China a secure retaliatory nuclear capability. Nonetheless, China continues to fear that the United States is pursuing capabilities to negate its nuclear deterrent. It interprets nascent U.S. prompt conventional strike capabilities, regional (e.g., THAAD) and limited homeland missile defenses, and the potential for U.S. offensive cyber operations as indications that the United States is determined to possess the ability to carry out a disarming first strike against China and defend against any surviving Chinese ballistic missiles. This concern that the United States is intent on having the capability to engage in nuclear coercion could motivate China to further increase its nuclear forces to promote their survivability against U.S. attack or to react in other ways that could undermine stability. In a crisis, fear of U.S. pre-emption could even lead the Chinese to use nuclear weapons first if it believed a U.S. disarming strike was imminent or on its way.

The United States wants a stable strategic relationship with China. It does not want China to feel it must build up its nuclear forces or abandon its long-standing, declared no-first use policy. Washington therefore has an interest in dispelling unwarranted Chinese concerns about U.S. nuclear intentions and capabilities and in pursuing its deterrence and assurance programs in a manner that minimizes the likelihood that they will be perceived by Beijing as intended to negate its deterrent. At the same time, China should have an interest in dispelling U.S. and allied concerns about the scale and objectives of its strategic programs, which Beijing has so far chosen to hide behind a shroud of secrecy.

While seeking a stable strategic relationship with China, the United States must continue to reassure its East Asian allies that it is committed to maintaining a credible and effective extended nuclear deterrent, even if China has an assured retaliatory capability. Maintaining key U.S. quantitative and qualitative advantages vis-à-vis China in strategic capabilities—together with strong U.S. and allied conventional forces in the region—can give U.S. regional partners confidence that the deterrent remains reliable. Moreover, even though the United States will inevitably be vulnerable to a Chinese retaliatory strike, explicitly and officially accepting mutual vulnerability as the basis for the U.S.-China strategic relationship would be unsettling to U.S. regional allies, especially Japan, without necessarily convincing the Chinese that the United States does not seek a disarming strategic capability. Therefore, while denying China an assured retaliatory capability should not be a goal of internal U.S. strategic planning, public acceptance of mutual vulnerability would not be advisable, especially at a time when U.S. regional allies are concerned about Chinese behavior.

Although bolstering the U.S. extended deterrent against North Korea is important for both South Korea and Japan, ensuring effective deterrence of China has a higher priority in Tokyo than in Seoul, given greater concerns in Japan about Beijing's regional behavior.

In the case of China, as in the case of North Korea, effective extended nuclear deterrence can be provided by U.S. central strategic systems and dual-capable fighter-bombers (the F-15E, F-16 and, in the future, the F-35). U.S. central strategic systems have the advantage of being available at any time, and their visibility in the region is enhanced by, for example, the deployment of B-52Hs and B-2s in Guam.

The Obama administration committed to make dual-capable aircraft deployable globally in support of U.S. commitments to its allies, a policy that should be sustained. But it also needs to be credible. At present, DCA transit the region on rotational assignments, but without nuclear weapons or explicit nuclear deterrence missions. The threat to deploy them in a time of crisis must be credible and accordingly requires the infrastructure and training to make it so. If the deterrence landscape continues to significantly erode, changes in the U.S. forward posture may be warranted. The rotational aircraft presence could become permanent, and exercises could be conducted with training warheads to demonstrate the capability to deploy nuclear weapons forward expeditiously. Such steps could forestall possible pressure to reintroduce American nuclear weapons to the Korean Peninsula.

Many of the measures the United States and its allies should take to reaffirm and bolster extended deterrence of North Korea are also applicable in the case of China, including high-level reaffirmations of U.S. commitment and resolve, and increased allied involvement (in this case, Japanese involvement) in the strengthening and adaptation of the regional deterrence architecture.

While sending the message to China through words and actions that the United States and its allies have the capabilities and will to defend their interests, Washington should also convey to Beijing that it wishes to pursue a strategic relationship that avoids a destabilizing arms competition, reduces mutual mistrust and worst-case planning, and decreases the likelihood that misperception and miscalculation will lead to increased tensions or even armed conflict. Despite U.S. efforts to conduct a bilateral, high-level strategic dialogue that could promote such a relationship, China has so far been reluctant to engage at the official level in a meaningful way. The Trump administration should seek to establish such a dialogue, even if the prospects of meaningful Chinese engagement seem limited.

A U.S.-Chinese strategic dialogue would provide an opportunity to make clear that the United States is determined to take whatever steps are necessary (e.g., THAAD deployment in South Korea) to defend itself and its allies against third parties like North Korea, but that it is also prepared to address concerns about the implications of such steps for China in the interest of mitigating as much as possible any adverse effects on bilateral strategic relations. In that connection, U.S. officials could indicate that, if the North Korean threat that motivated U.S. and allied responses were reliably reduced or eliminated, such a development could lead to adjustments in the U.S. and allied response (e.g., THAAD deployments). A bilateral strategic dialogue would also provide an opportunity for China to make available information that could address U.S. concerns about the magnitude and goals of its modernization programs.

At a more operational level, the dialogue could build on existing arrangements to reduce the possibility of accidents and incidents involving U.S. and Chinese military assets operating in close proximity. It could also develop strategic confidence-building measures and crisis management mechanisms. And it could discuss possible rules and norms governing cyber and anti-space capabilities.

Deterring Iran

Unlike Russia, North Korea, and China, Iran does not have nuclear weapons. If it continues to abide by the Joint Comprehensive Plan of Action (JCPOA), it will not be able to produce fissile material for nuclear weapons for at least 10 to 15 years. Deterring Iran, therefore, does not mean deterring the use of nuclear weapons or deterring conventional aggression under the cover of a nuclear capability. Instead, it means deterring a future Iranian decision to opt for nuclear weapons and, in the nearer term, discouraging Iran from pursuing destabilizing policies aimed at altering the regional balance of power in its favor at the expense of U.S. regional partners.

Maintaining the JCPOA's constraints on Iran's nuclear programs is very much in the U.S. interest and in the interest of regional stability. The United States should hold Iran to a strict standard of compliance

with the JCPOA. At the same time, Iran must have continuing incentives to fulfill its commitments, and that means ensuring that the Iranians receive the sanctions relief benefits to which they are entitled under the nuclear deal. Thus, while the United States should enforce existing non-nuclear sanctions (which are not precluded by the JCPOA) and, when warranted, should impose new sanctions for non-nuclear reasons (e.g., ballistic missile activities), it will need to ensure that any new sanctions are well justified and carefully targeted on Iran's non-nuclear activities to avoid the impression that it is restoring pre-JCPOA sanctions under a non-nuclear label and seeking to reverse the benefits of sanctions relief.

JCPOA restrictions on Iran's nuclear capacity, especially its capacity to enrich uranium, will expire; some restrictions will expire after 10 years and others after 15 years. Once they lapse, Iran can legally build up its nuclear capacity to the point where it could produce enough fissile material for nuclear weapons in a matter of weeks. It would still be obligated under the JCPOA and the Non-Proliferation Treaty not to produce nuclear weapons—and intrusive monitoring measures would remain in place after 15 years to detect any Iranian attempt to violate those obligations—but it would have the physical capacity to build nuclear weapons relatively quickly if it decided to run the risk of doing so.

In the next several years, the United States and other parties to the JCPOA should seek to dissuade Iran from pursuing a large-scale enrichment capacity when the agreement's nuclear restrictions expire, making the sound case that, especially with Russia supplying fuel for Iran's nuclear power reactors, there is no valid civil nuclear energy need for Iran to have the sizable enrichment capacity required to produce its own fuel. At a minimum, they should press Iran to defer the expiration dates for several years.

Iran will not forgo or even postpone a large-scale enrichment capacity unless it receives something in return. President Hasan Rouhani and other senior Iranian officials have made clear that they would like to see the termination or reduction of U.S. sanctions that were not suspended under the JCPOA and that have continued to be a drag on Iran's economic recovery. The Trump administration, which has previously talked about renegotiating the JCPOA, could offer to address Iranian concerns about remaining U.S. sanctions in return for stronger or more long-lasting restrictions on Iran's nuclear programs.

If Iran is ultimately not willing to forgo or defer a large-scale enrichment program and proceeds to ramp up its capacity when key restrictions expire, the United States should seek to deter Iran from using its increased enrichment capacity to produce nuclear weapons. Among the various options for discouraging an Iranian nuclear breakout, the U.S. president, with the support of Congress, could declare that it is the policy of the United States to prevent Iran from acquiring nuclear weapons, if necessary with the use of military force.

In the near term, while preserving and strictly enforcing the JCPOA, the Trump administration should work closely with its Middle Eastern partners to counter Iran's provocative regional activities, such as its intervention in the Syrian civil war, its use of proxies to destabilize governments of the region, its ballistic missile programs, and its harassment of U.S. naval vessels. The administration's efforts should include maintaining a formidable U.S. military presence in the region; strengthening the defense capabilities of Gulf partners through arms transfers, training, and joint exercises; addressing the Iranian missile threat by impeding missile-related procurement, imposing missile-related sanctions, and promoting integrated regional missile defenses; and interdicting Iran's arms supplies to its regional proxies. While pushing back against destabilizing Iranian behavior, the United States and its partners should also be prepared to engage with Iran if it is prepared to work constructively to resolve regional problems.

Deterring and Preventing Nuclear Terrorism

Since 9/11, preventing terrorist groups from acquiring and using weapons of mass destruction, especially

nuclear weapons, has been a top national security priority supported by a strong bipartisan consensus. Much of that effort has been directed at countering the terrorists themselves, including the U.S.-backed campaign to eliminate the Islamic State's territorial and resource base in Iraq and Syria. Perhaps the surest way of preventing nuclear terrorism is denying the terrorists access to nuclear weapons or the materials needed to produce them. U.S. administrations of both political parties have made great progress in reducing, consolidating, and securing sensitive nuclear materials worldwide. U.S.-Soviet and later U.S.-Russian cooperation under bilateral cooperative threat reduction programs made a major contribution toward that goal. Now, however, with the downturn of relations between Washington and Moscow and the demise of bilateral threat reduction programs—and the conclusion of the highly productive 2010-16 Nuclear Security Summit process—there is a risk that the progress achieved in recent decades will not be sustained. The signatories believe that, despite current budgetary pressures, the Trump administration should reverse the recent decline in U.S. funding for international nuclear security programs. It should also maintain U.S. support for a range of multilateral efforts to prevent nuclear terrorism, including U.N. Security Council resolution 1540, the Global Initiative to Combat Nuclear Terrorism, and the Proliferation Security Initiative.

The difficulty of deterring suicidal terrorists, especially those without a "return address," has long been recognized. However, previous administrations have sought to reduce the risk of nuclear terrorism by seeking to deter foreign governments and other entities from assisting terrorists in any way to acquire or use nuclear weapons. The Trump administration should reaffirm the commitment articulated by National Security Adviser Stephen Hadley in 2008 (and repeated verbatim by the Obama administration in 2010) that the United States would 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. Advances in nuclear forensics and other improvements in attribution, as well as the strengthening of mechanisms for international accountability, would increase the deterrent effect of that policy by increasing the likelihood that a nuclear detonation or discovered nuclear device could be attributed to a particular source and that perpetrators would face severe consequences for their actions.

Moreover, strengthening homeland security could enhance "deterrence by denial" by convincing would-be nuclear terrorists that any attempt to smuggle a nuclear device into the United States and detonate it is likely to be thwarted.

CHAPTER 2

The Role of U.S. Central Strategic Systems

During the Cold War, the principal role of U.S. central strategic systems (ICBMs, SLBMs, ballistic missile-carrying submarines, and strategic bombers) was to deter a massive Soviet strike against the U.S. homeland—either a surprise, disarming first strike or a massive Soviet retaliatory strike if the United States and NATO used nuclear weapons in Europe to repel a large-scale Warsaw Pact conventional attack.

At present, the likelihood of a massive nuclear attack against the U.S. homeland is remote, especially a "bolt out of the blue" in the absence of nuclear use at the regional level. Russia, the only country that presently has sufficient nuclear forces to even contemplate a disarming first strike on the United States, understands that the United States would still retain enough surviving strategic forces to inflict a devastating response. The main prospect of nuclear conflict arises in regional scenarios in which a U.S. adversary, in the midst of a conventional armed conflict, elects to initiate the limited use of nuclear weapons.

The job of deterring or responding to such first use would fall both on U.S. central strategic forces and on theater-based capabilities. Forward-deployed or -deployable nuclear weapons and delivery systems, missile defenses, and other non-nuclear capabilities contribute significantly to deterrence by virtue of being distinctly regional capabilities—and they are of particular importance to U.S. allies both as symbols of U.S. commitment to their security and as credible response options and links to U.S. strategic forces.

Still, central strategic systems remain the bedrock of U.S. deterrence policy, both for extending deterrence to U.S. allies in Europe and East Asia and for deterring direct attacks against the U.S. homeland. Their critical roles today include deterring an adversary from escalating a limited regional nuclear conflict, providing a capability other than theater-based nuclear forces to reliably carry out limited strikes in a regional scenario, and, however remote the possibility, deterring a massive attack against the U.S. homeland and providing an appropriate response if deterrence fails.

Modernization

The future of U.S. central strategic systems is a key focus of the Trump administration's Nuclear Posture Review. Each leg of the U.S. Triad of ICBMs, SLBMs and SSBNs, and dual-capable heavy bombers contributes unique characteristics to the deterrence mission and presents adversaries with unique challenges. Together they have provided a hedge against unforeseen technological surprises (e.g., a breakthrough in underwater detection) or geopolitical developments. With all legs of the Triad approaching the point where they will be operating beyond their expected service lives, the signatories believe proceeding with modernization is imperative. Most members of the group support the currently planned modernization of each of the three legs, while some have reservations about committing to a Triad in the future, especially to the ICBM leg.

Ballistic Missile Submarines

As the most survivable leg of the Triad, SSBNs are the core of the U.S. deterrent. Plans should go forward to replace Ohio-class SSBNs with Columbia-class SSBNs and extend the life of Trident II D5 missiles.

Intercontinental Ballistic Missiles

An ICBM force of single-warhead missiles provides a highly reliable and responsive capability that can be employed in discrete, limited attack options as well as in large-scale responses. A land-based force enhances deterrence because adversaries know that an attack on U.S. ICBMs—unlike an attack on SSBNs at sea—is an attack on the U.S. homeland and would surely trigger a devastating U.S. nuclear response. The Ground Based Strategic Deterrent (GBSD) program has been designed to provide an effective replacement for Minuteman ICBMs. (The GBSD program could explore a road-mobile option as a hedge against SSBN vulnerability, although the public interface challenge that stymied past efforts at ICBM mobility would be very difficult to overcome.)

As the United States modernizes its sea- and land-based ballistic delivery systems, it must also ensure that the weapons are capable of assured penetration to their targets. Russia is modernizing its missile defenses against strategic and regional offensive systems in the context of its broader aerospace defense strategy. China is also pursuing advanced missile defenses. Over the lifetime of the modernized U.S. deterrent, the ability of these systems to penetrate adversary defenses may come into question and should not be overlooked.

Considering Modernization Plans

Able to perform both conventional and nuclear missions, heavy bombers are the most flexible leg of the Triad. With adversaries deploying increasingly capable air defenses, it will be essential to go ahead with the dual-capable B-21 penetrating bomber, which will carry the B61-12 gravity bomb. (The planned Long-Range Stand-Off air-launched cruise missile, or LRSO, is addressed below.)

The current "program of record" on strategic modernization calls for 12 Columbia-class SSBNs, 400 deployed ICBMs, and 80-100 B-21 bombers. While supporting strategic force modernization, members of the group recognize that the scale, composition, and timing of these replacement programs could be affected by such factors as changes (positive or negative) in the threat environment, developments in SSBN survivability, developments in adversary air defense and missile defense programs, cost and budgetary considerations, and possible future arms control agreements.

Some members believe that U.S. deterrence requirements could be met by a Triad consisting of fewer deployed systems than envisaged in the program of record (e.g., 10 Columbia boats, 300 or fewer deployed ICBMs), and they note in this connection that the New START Treaty level of 1,550 deployed strategic warheads could be accommodated on a smaller number of delivery platforms. Some also suggest that some modernization, especially of the ICBM force, could be deferred and that up-to-date estimates should be made of the cost of life-extending Minuteman IIIs compared to the cost of the GSBD program. Regarding the budgetary implications of modernization, the high price tag of the current program of record could force painful trade-offs with other strategic or military priorities. Some thus believe that budget-driven adjustments are inevitable, and that it is better to make prudent adjustments from the outset rather than proceed with the current plan and be forced later to stretch out and curtail programs in a less strategically coherent manner.

Other members of the group maintain that the Trump administration should endorse the existing program of record, noting that it has so far received wide support in Congress. While acknowledging that 1,550 warheads could be deployed on fewer delivery platforms than currently planned, they believe

that reducing the number of platforms, especially SSBNs, could increase the vulnerability of the force. They argue that, while the absolute cost of current strategic modernization plans is surely high (perhaps $1 trillion over several decades), the annual cost is less than 1 percent of the annual federal budget, which would mean a nuclear share of the total Department of Defense and National Nuclear Security Administration budget of no more than 6.5 percent (compared to the current 3.5 percent share). They continue that, given that nuclear deterrence remains a top national security priority, this would be "affordable." These members believe there is no need to make adjustments now and that programs can be scaled back or ramped up as warranted by evolving conditions and decided by future policymakers. Still others believe that the currently planned force structure was set in a more benign security environment that no longer exists and may prove inadequate if the environment continues to erode.

Notwithstanding these differences, all members of the group believe that modernization is required not just for strategic forces delivery platforms but also for the enabling and support capabilities needed to maintain the effectiveness of the U.S. nuclear deterrent. Nuclear command, control, and communications systems—which provide early warning and other critical information to national authorities and enable the president to reliably and securely communicate with and control U.S. deterrent forces—are in urgent need of upgrading, including to ensure their protection against kinetic and non-kinetic threats.

Also, the Department of Energy's nuclear weapons industrial complex must be modernized in order to ensure that the United States can maintain a safe, secure, reliable, and effective nuclear stockpile. Such modernization would also provide a responsive production capacity as a hedge against geopolitical surprise (such as nuclear breakout by an adversary) or a technical surprise (such as a problem in an aging warhead or delivery system). An improved infrastructure hedge may also allow further reductions in the number of non-deployed (reserve) nuclear weapons currently retained as a technical or geostrategic hedge. Given the one-of-a-kind nature of the nuclear complex facilities, their modernization is an especially expensive proposition and has been resisted repeatedly by policymakers. It can no longer be delayed, although requirements for the facilities must be clearly understood and designs nearly complete prior to baselining so that cost projections are realistic.

The signatories believe the current strategic plan for the nuclear weapons stockpile—including the completion of warhead life extension programs and the "3+2" strategy for transitioning from 11 to five warhead types—can meet U.S. deterrence requirements, including for discriminate, low-yield options and could possibly enable a reduction in the overall stockpile as the needed number of reserve strategic warheads declines.[3] New nuclear weapons, including those with specially tailored effects, are not necessary to ensure the credibility of the deterrent. What is necessary is strong, long-term support for the science-based Stockpile Stewardship Program and the associated stockpile responsiveness plan. These efforts help ensure the development and retention of the skilled workforce required to assess and certify the nuclear weapons stockpile without nuclear testing. They also help to ensure that the United States has the capability to make any further design modifications that may be warranted in the future. As called for in the 2016 National Defense Authorization Act, U.S. nuclear weapons laboratories would be able to explore alternative design concepts and build prototypes of some designs. Most members of the group believe that, as long as this is done in the context of rejecting new nuclear military capabilities

[3] The "3+2" strategy refers to a plan to have a U.S. stockpile consisting of five warhead types: three interoperable warheads that could be deployed on ICBMs or SLBMs, the B61-12 gravity bomb, and the warhead for the Long-Range Standoff air-launched cruise missile. Support for this plan assumes that the "3+2" transition can be implemented in an affordable manner, that it would not require a return to nuclear-explosive testing, and that the warhead modifications for the three interoperable warheads would not inject unacceptable additional risks into the stockpile.

in the stockpile, new missions for nuclear weapons, and the resumption of nuclear testing, it is a prudent hedge against future technical and geopolitical risks. However, some others believe it could contravene the Obama administration's policy not to pursue new nuclear weapons.

While signatories of this report support modernization efforts (although some have reservations about the ICBM leg), they differ on a few modernization issues under consideration by the Trump administration. In particular, they disagree on the planned LRSO. LRSO supporters point out that it would replace the existing air-launched cruise missile as a means for bomber-delivered strikes without the need for manned aircraft to penetrate adversary air defenses and would therefore not introduce a new military capability. They maintain that proceeding on schedule with the LRSO program is necessary to avoid a gap in air-delivered deterrence capabilities, and they point out its applicability to both the European and Asian theaters. They also reject the argument that the missile is destabilizing, maintaining instead that its display in a crisis would send a particularly powerful signal of U.S. resolve, and they believe a U.S. decision to forgo LRSO would be unlikely to result in comparable restraint by Russia or China.

Critics of the program maintain that LRSO is redundant given the penetration capability of the B-21, that most of the regional stand-off mission can be covered by the increasing inventory of long-range, conventional air- and sea-launched cruise missiles, and that U.S. acquisition of LRSO would encourage other countries to proceed with their own nuclear-armed cruise missile programs. At a minimum, critics believe that the LRSO can be deferred until evolving risks to bomber penetration justify a stand-off weapon.

Despite these differences, there is agreement that any decision to delay or forgo the LRSO would increase the importance of the B61-12 modernization program, if the U.S. military is to maintain an air-breathing leg in its strategic nuclear force.

Signatories also differ on whether to resurrect the nuclear capability of the Tomahawk sea-based cruise missile—known as TLAM-N, for Tomahawk land-attack missile, nuclear—which was removed from U.S. Navy warships in the early 1990s and whose warhead was retired a decade ago. Unlike LRSO, resurrection of TLAM-N was not included in the Obama administration's "program of record." Proponents maintain that a revived TLAM-N would bolster extended deterrence in Europe and East Asia, provide an incentive for Russia to return to compliance with the INF Treaty, and be a suitable countermeasure if the Russians do not comply. They also state that reintroducing TLAM-N would not be overly costly, that it would be strongly welcomed by certain NATO and Northeast Asian allies, and that the missile could be survivably based in submarines (and accordingly could provide a hedge against the potential vulnerability of SSBNs).

Opponents of resurrecting TLAM-N contend that a combination of U.S. central strategic systems and forward-deployed and -deployable DCA already provide effective extended nuclear deterrence, that reviving TLAM-N would eliminate any chance that the United States might persuade the Russians not to continue their nuclear-armed, sea-launched cruise missile program, and that conventionally-armed, sea-based and air-delivered systems can effectively shore up regional deterrence. They also believe that the cost of TLAM-N revival—including the installation of new fire control systems on submarines and the fielding of suitable warheads (most likely requiring a significant expansion of the life extension program for the W-80)—would detract from higher priority programs and that the reintroduction of a system whose removal from service was viewed as reducing U.S. reliance on nuclear weapons would be criticized domestically and internationally as a backward step.

Both sides agree that there are important technical issues to be resolved regarding the most cost-effective way to redeploy TLAM-Ns, if a decision were taken to proceed. A serious technical analysis should therefore be conducted to inform future decisions.

CHAPTER 3

Nuclear Weapons Employment Policies

In the wake of its Nuclear Posture Review, the Trump administration can be expected to review and possibly modify the president's nuclear employment guidance. Since the end of the Cold War, each presidential administration has revised the inherited nuclear employment guidance. That guidance is highly classified. But some main trends in its evolution since the end of the Cold War are clear. The guidance has moved in the direction of giving the president more options (including limited ones), taking advantage of technical advances to enable a smaller number of warheads to hold at risk a given set of targets, removing certain targets and categories of targets from the employment plan, providing the flexibility in a crisis to adapt pre-planned employment options to emerging developments, and introducing accurate conventional systems into employment planning.

Elements of continuity have been as important as elements of change. These include the tailoring of nuclear plans to a diverse set of possible adversaries, a rejection of population and societal targeting in favor of targeting particular assets valued by an adversary's leadership, and an acceptance that the laws of war govern U.S. nuclear employment planning, including that U.S. nuclear use would be constrained by the principles of proportionality and discrimination (of civilian from military targets).

Sole Purpose/No First Use

Among the issues that the review of employment guidance will presumably consider are the circumstances in which U.S. nuclear weapons might be used. The Obama administration reiterated the statement made by preceding administrations that the "fundamental" purpose of U.S. nuclear weapons is to deter a nuclear attack on the United States or its allies. It went on to consider whether this could be reformulated to express the idea that deterrence of nuclear attack is the "sole" purpose of U.S. nuclear weapons. The 2010 Nuclear Posture Review pointed out that powerful U.S. conventional military capabilities, including missile defenses, provide a strong deterrent against non-nuclear (conventional, biological, or chemical) attacks, but it concluded that "there remains a narrow range of contingencies in which U.S. nuclear weapons may still play a role in deterring a conventional or CBW [chemical or biological weapons] attack." The NPR therefore stopped short of adopting a "sole purpose" posture, but stated that the United States would work to establish the conditions under which such a policy could be safely adopted.

In the event of a conventional or CBW attack against the United States or its allies or partners, it is unlikely that U.S. military commanders would actually recommend, and that an American president would actually authorize, a nuclear response, especially given the range of increasingly capable conventional response options that would be available. Moreover, given the U.S. negative security assurance that it will not use nuclear weapons against non-nuclear weapon states in compliance with their non-proliferation obligations, the U.S. option to use nuclear weapons first applies almost exclusively to a handful of nuclear-armed states, meaning that any such first use would run the risk of a nuclear response.

But even though the credibility of U.S. first use is limited, formally renouncing it could remove altogether whatever deterrent value it might still have in the minds of potential adversaries. And perhaps more importantly, adopting sole purpose or no first use, especially at a time of heightened tension and threat, could erode confidence in the efficacy of the U.S. extended nuclear deterrent on the part of allies in Northeast Asia and Central and Eastern Europe, who have traditionally been very wary of disavowing the first-use option.

So far at least, the potential benefits of moving to a sole purpose posture—including decreasing incentives for U.S. adversaries to attack first out of fear of a U.S. first strike, delegitimizing the first-use option (e.g., as in Russia's "escalate to de-escalate" doctrine), and strengthening U.S. non-proliferation credentials by demonstrating a reduced role for U.S. nuclear weapons—have not outweighed these possible downsides. As allied conventional defense and deterrence capabilities become stronger and if regional security environments become more stable and less threatening, the United States, in close consultation with its allies and partners, should revisit the issue of sole purpose.

Targeting

An issue that will be addressed in the review of employment guidance is the number and character of targets that will be held at risk and subject to attack if deterrence fails. The goal of U.S. deterrence policy is to convince any potential adversary that the adverse consequences of attacking the United States or its allies and partners would far outweigh any potential gains it may hope to achieve by such an attack. That requires maintaining a sufficient number of survivable and effective nuclear weapons to "hold at risk what the other side holds most dear."

According to U.S. official public statements,[4] U.S. employment plans have long assumed that Russian leaders place a very high value on Russian strategic forces and other war-making and war-supporting assets, as well as on the leaders' instruments of political and military control and their own ability personally to survive a nuclear conflict. The review of employment guidance should take a fresh look at what today's Russian (and North Korean and Chinese) leaders hold most dear.

The 2013 Report on Nuclear Employment Strategy of the United States indicated that the United States will "maintain significant counterforce capabilities against potential adversaries," suggesting that military-related targets would remain a central part of the target base. In the case of Russia, for example, the review could consider whether, in addition to continuing to target strategic and other military assets, deterrence would be strengthened by holding out the prospect of using precision-guided conventional strike systems to hold at risk such infrastructure targets as power plants, oil refineries, transportation hubs, and communication nodes, the destruction of which would disrupt the functioning of today's more closely integrated Russian economy and society and imperil the Kremlin's ability to maintain control. The review could examine whether the inclusion of high-leverage infrastructure sites in the target mix and assigning conventional weapons to them would assist in threatening outcomes that today's leaders in the Kremlin would consider unacceptable. It could also examine whether the use of conventional weapons to target infrastructure sites could produce sufficiently damaging outcomes to add measurably to deterrence while at the same time minimizing collateral damage to civilian populations in accordance with existing U.S. policy.[5]

The review of employment plans could also ask some basic questions about the range of target categories subject to attack if deterrence fails. Should the United States, for example, have the goal in a retaliatory strike of impeding an adversary's ability to launch prompt follow-on strikes by attacking its

[4] For a review of the evolution of U.S. employment guidance since the Cold War, see Paul Bernstein, "Post-Cold War U.S. Nuclear Strategy," in *On Limited War*, eds. Jeffrey Larsen and Kerry Kartchner (Palo Alto, CA: Stanford University Press, 2014).

[5] Another factor to consider is whether the targeting of infrastructure sites with conventional weapons would adversely affect prospects for establishing norms against attacking critical civilian infrastructure with cyber weapons.

strategic forces and command facilities—or should it pursue the broader goal of also impeding the adversary's ability to reconstitute its nuclear forces over a longer period of time by targeting nuclear storage, production, and assembly facilities? Similarly, should the U.S. goal be to impose immediate, unacceptable costs or should the goal also be to degrade the adversary's ability in the post-war world to recover and pose a long-term military challenge, including by attacking its war-supporting industries? The answers to these and other questions could affect the size and composition of the target base and the numbers and types of nuclear and conventional strike weapons needed to execute the employment plan.

The review, moreover, should consider how, and the extent to which, any modifications in the U.S. approach to targeting would be conveyed diplomatically or made public, bearing in mind that since deterrence is intended to affect the adversary's future actions, it may be useful for the adversary to know certain things about U.S. intent, as well as about U.S. capability. In that adversary estimate of possible U.S. lines of action, inherent capability is likely to be the dominant factor, but declaratory policy also has some impact if only to emphasize that certain U.S. actions have official doctrinal endorsement.

Alert Status

The review of presidential nuclear employment plans will also address the alert status of the Triad. Currently, U.S. nuclear-capable heavy bombers are off full-time alert; nearly all ICBMs are on alert; and a significant number of SSBNs are at sea at any given time. We do not recommend changes in alert status at the present time. Should the strategic environment change in coming years, consideration could be given to adjusting alert status accordingly.

Launch under Attack

In the event that U.S. early warning satellites and radars detect a massive ballistic missile attack against U.S. ICBMs and other strategic forces, the U.S. president can order the prompt launch of nuclear forces before the arrival of incoming warheads. Especially during the Cold War, when the United States feared a surprise disarming strike by the Soviet Union against its ICBMs, a "launch under attack" (LUA) capability was considered essential to deterrence because it would discourage the Soviets from thinking they could disarm the United States—or at least disrupt critical communications and disarm the land-based leg of the U.S. Triad—by striking first.

The prominence of LUA has dropped significantly in recent decades. Even with the current downturn in U.S.-Russian relations, it is very unlikely that Moscow would attempt a massive disarming strike (and Russia is the only other nuclear power with sufficient nuclear forces to pose even a theoretical threat to the U.S. deterrent). U.S. ICBMs no longer carry multiple independently targetable re-entry vehicles (MIRVs). With the de-MIRVing of the U.S. ICBM force, which has made Minuteman III missiles increasingly "expensive" targets in an arms control environment (an attacker would have to expend at least one warhead, and more likely two, to destroy a single ICBM), the incentive to attack U.S. ICBMs has been substantially reduced. Moreover, although the Russians maintain the capability to carry out a massive attack against the United States quickly and with little warning, the increased percentage of U.S. nuclear weapons that in a crisis situation could be deployed survivably at sea has further reduced the already low incentive to try to disarm the United States.

The 2013 Report on Nuclear Employment Strategy, while retaining LUA, directed the Department of Defense "to examine further options to reduce the role of Launch Under Attack in U.S. planning." The Trump administration should consider whether to adopt a policy that, in the event early warning sensors detect a possible massive attack, the planning assumption would be that the president would wait for a confirmed detonation of an incoming warhead before ordering the launch of ICBMs (or any other part of the nuclear force) in response. Such

a policy would not require physical changes to the ICBM force. It would remain on alert and would be available for a wide range of options, including limited attacks in a regional conflict. But although the president would retain the capability to launch U.S. ICBMs promptly as long as they remained on alert, he or she, as a matter of policy, would decide not to launch them absent a confirmed detonation. Such a policy would require not only high confidence that sufficient delivery systems would survive (presumably mostly SLBMs on SSBNs) but similarly high confidence in command-and-control arrangements capable of ensuring that the president or a legitimate successor (if the president is killed or rendered incommunicado) can direct U.S. nuclear forces so that a post-impact response would be possible.

Signatories of this report differ on whether to change the current approach toward LUA.

Supporters of waiting for a confirmed detonation cite cases in which early warning systems initially misidentified non-threatening phenomena as missile attacks as well as the potential for third-party cyber intrusions to trigger such false alarms, and they argue that the possibility of executing LUA on the basis of faulty information, however small, should be eliminated altogether by renunciation of the option. They claim that the United States can afford to declare its willingness to "ride out" a massive strike, knowing that its survivable sea-based forces would continue to provide a powerful deterrent. In addition, they maintain that it makes little sense to require the U.S. president to make the most consequential decision in history in 10 or so minutes. Rather than spending those minutes seeking to gain certainty about the situation and sort through available options, advocates of not executing LUA believe the time would be better used getting the president to safety and ensuring that he or she is in a position under less time pressure to evaluate the situation carefully and decide on the most appropriate response. Advocates also believe that altering the current approach toward LUA would reassure domestic and foreign audiences that the United States is moving away from what is often seen publicly as a remnant of a Cold War nuclear posture and further reducing the possibility of nuclear conflict arising from accident or misinterpretation

Supporters of retaining the current approach toward LUA believe that any adversary contemplating a debilitating surprise nuclear attack against the United States must have to consider the possibility that the U.S. president will react quickly, including while the attack is underway, with a nuclear response that includes an ICBM force of sufficient size and strength to deny the adversary's objectives and impose unacceptable costs. They note that, at least in part, such an attack is more remote today precisely because of the deterrent effect of LUA. While it is difficult to envision all of the scenarios that could present the president with the choice of responding or not responding, such a choice would be shaped by many factors, including whether the attack is occurring "out of the blue" when a smaller portion of the SSBN force is at sea. To reduce concerns associated with LUA, the United States has deployed more effective warning systems, introduced layers of technical and procedural safeguards, and adopted plans and response options to make more choices available to the president. It could also make explicit that, while the possibility of LUA remains, the planning assumption should be that U.S. strategic forces must be capable of providing sufficient deterrence without reliance on LUA. Defenders of the current approach also believe that, especially with Russia (and China) unlikely to reciprocate a U.S. decision to alter the approach toward LUA (and the difficulty of verifying if they did), the benefits of changing the current U.S. LUA posture would be very limited.

Force Levels

Like the Obama administration's 2013 review of the nuclear employment strategy, the Trump administration's review will probably address force levels needed to support U.S. deterrence requirements. The 2013 review concluded that the United States could maintain a strong and credible deterrent while pursuing up to a one-third reduction in deployed

strategic warheads from the 1,550 ceiling established in the New START Treaty to a level of roughly 1,000. The signatories agree that current U.S. deterrence requirements could be met with a properly designed force structure at a level of 1,000 deployed strategic warheads, assuming that New START and the New START counting rule that attributes one strategic warhead to each deployed bomber remain in effect. However, given the state of U.S.-Russian relations and Moscow's current efforts to enhance its nuclear capabilities—and the political and psychological importance associated with rough parity in the U.S. and Russian forces—the group believes that, rather than moving to lower levels unilaterally, the United States should continue to require that Russia join in further reductions of nuclear forces.

The signatories also believe that the United States should retain the capability to forward-deploy nuclear weapons with dual-capable aircraft and heavy bombers to provide extended deterrence to U.S. allies and partners. That includes maintaining a forward-based nuclear posture in NATO countries, which is important now given Russia's provocative actions and policies, especially in Central and Eastern Europe. Any change in the number of U.S. forward-based nuclear weapons would depend on the evolution of the threat from Russia and agreement among NATO members.

The United States should also maintain a sufficient number of non-deployed (reserve) nuclear weapons as a hedge against the possibility of a technical problem developing in a particular weapon type or delivery system, or a geopolitical event or development that could significantly alter Washington's strategic calculus. While the United States previously retained both a technical hedge and a geopolitical hedge, the 2013 Report on Nuclear Employment Strategy eliminated a separate geopolitical hedge because a technical hedge would also provide the United States the capability to upload additional weapons on delivery systems in response to urgent geopolitical developments. The U.S. nuclear stockpile (deployed and non-deployed, strategic and non-strategic) was 4,018 weapons as of September 2016. That figure did not include an estimated 2,500 weapons that have been removed from the stockpile and are awaiting dismantlement. The implementation of current plans to modernize the Department of Energy's nuclear weapon complex should provide an increased capability to manufacture nuclear weapons and components more rapidly in response to unforeseen developments and will further reduce the number of non-deployed nuclear weapons required as a hedge.

Nuclear force levels will also be influenced by the role played by conventional strike systems in meeting U.S. deterrence requirements. The 2010 NPR Report called for the development of prompt global strike capabilities, which it said may be particularly valuable for the defeat of time-urgent regional threats. Although the development of conventional prompt global strike capabilities was curtailed by test failures and the Budget Control Act of 2011, development of long-range, conventionally armed cruise missiles (e.g., the Joint Air-to-Surface Standoff Missile-Extended Range [JASSM-ER] and the Tactical Tomahawk sea-launched cruise missile) has continued, though they lack the promptness of ballistic missiles. The Department of Defense was tasked in 2013 to conduct deliberate planning for non-nuclear strike options to consider what contributions such systems could make to deterrence. Although conventional systems inherently lack the deterrent value of nuclear weapons and cannot fully substitute for them, the integration of non-nuclear systems into U.S. deterrence planning, especially in regional scenarios, could reduce to some extent the numbers of nuclear weapons required and should be pursued. At the same time, consideration of the contribution of conventional systems to deterrence planning should take into account that some U.S. allies may be concerned that a greater role for such systems would signal a reduced U.S. readiness to rely on its nuclear arsenal to extend deterrence—and that the Russians and Chinese could perceive such a greater role as validating their concerns about the use of U.S. conventional systems in a disarming strike.

CHAPTER 4

Missile Defense

In addition to its Nuclear Posture Review and its related review of presidential nuclear weapons employment guidance, the Trump administration is conducting a congressionally-mandated review of U.S. missile defense policy and posture, including the contribution of regional and homeland defenses to U.S. deterrence objectives. The review will address key elements of existing U.S. missile defense policy in light of the deterioration of the international security environment since the 2009 missile defense review and especially the increased threat to U.S. and allied interests posed by Russian, North Korean, and Chinese missile programs.

Homeland Defense

A key issue in the review will be the role of homeland missile defenses. U.S. policy since the Clinton administration has been to pursue defenses capable of protecting U.S. territory against the limited missile threats posed by countries such as North Korea and Iran, but not to seek the far more extensive capability needed to defend against the sophisticated, large-scale missile attacks that Russia and increasingly China are capable of mounting. The effort to protect the homeland against Russian and Chinese attacks has been seen as too challenging technically, too expensive even if the technology were available, and likely to trigger an offense-defense competition that would undermine strategic stability with both Moscow and Beijing, particularly as it appears that those countries could build and deploy decoys and additional warheads at considerably less expense than the United States could build and deploy effective missile interceptors. They thus would have every incentive, as well as the financial and technical resources, to defeat U.S. defenses by sheer numbers.

The 2017 National Defense Authorization Act directs the administration to develop plans for a robust homeland defense, as opposed to the more modest goal of homeland protection from the limited strikes of which North Korea and Iran might be capable. This implies a possible role for homeland defense vis-à-vis China and even Russia. However, the reasons for not seeking a homeland defense against Russia and China remain valid. In today's stringent budgetary environment, the sharply increased funding needed to pursue a much more ambitious defense could come at the expense of modernizing the Triad and key support capabilities. And with Russia and China both placing high priority on developing means to overcome U.S. defenses, the pursuit of such a defense would likely not only be expensive, but futile. The group therefore believes the Trump administration should reaffirm the goal of a limited homeland defense.

A related issue is whether the United States should enhance its capability to defend the U.S. homeland against the growing North Korean ballistic missile threat even if it eschews the much more demanding capability needed to defend against Russia and China. A key component of U.S. homeland defenses is the Ground-Based Interceptor (GBI), whose flight test record has been mixed, although its most recent test on June 6, 2017 appears to have been a success. By the end of 2017, 44 GBIs are scheduled to be deployed in Alaska and California. To hedge against

the possibility of rapid growth in North Korean (and Iranian) long-range missile capabilities, Congress required the Obama administration to initiate the process for evaluating possible sites for a third GBI base. This would be in addition to the infrastructure now in place in Alaska to increase the number of interceptors deployed there to up to 100. (While the Alaska site can engage ballistic missiles from the Middle East, it is not optimal, e.g., it could not "shoot-look-shoot again" against missile attacks from the Middle East.)

In light of recent advances in DPRK missile programs, the Trump administration should explore how best to further upgrade homeland defenses against North Korean attack. Consideration should be given to increasing the number of GBIs, although simply boosting numbers is not a solution. Any increase in the number of GBIs should be accompanied by demonstrated improvements in GBI reliability, including kill vehicle reliability, strengthened sensor capabilities, and enhanced engagement tactics. GBIs could perhaps be deployed with "multiple-object kill vehicles" if and when available, which could enable each interceptor to engage multiple targets. The administration should also consider cyber and other means of disrupting North Korean missile operations before launch (so-called "left-of-launch" capabilities).

Enhancing U.S. homeland defenses against North Korea can be expected to increase China's concerns about a U.S. threat to its deterrent and possibly lead to an expansion of Chinese missile capabilities. An increase in the number of Chinese ICBMs or other strategic offensive systems that could target the United States is not in the U.S. interest. As suggested earlier, the group believes the United States should seek through dialogue to address Chinese concerns, reduce any Chinese incentives to build up its strategic capabilities, and mitigate as much as possible any adverse effects on the bilateral strategic relationship. But Beijing will need to understand that the United State will take steps as necessary to deal with what it sees as a rapidly emerging danger.

Regional Defenses

The missile defense review will also cover regional defenses in Northeast Asia, Europe, and the Middle East to protect U.S. allies and U.S. forces in those regions.

The most urgent priority will be addressing the threat from North Korea. As discussed earlier, a regional defense will be required, with additional Patriot batteries, THAAD in South Korea, Guam, and perhaps Japan, and Aegis-equipped warships. South Korea, Japan, and the United States have largely pursued national missile defense programs to cope with the North Korean threat. As additional capabilities become available for lower-tier and high-altitude defense, it will be important for the allies to more closely integrate their efforts.

Beijing has voiced strong opposition to U.S.-led regional missile defense efforts, and has waged an especially aggressive campaign to persuade the ROK government to reject the deployment of the U.S. THAAD system in South Korea, claiming that the system could threaten China's deterrent. Washington and Seoul must remain firm in proceeding with THAAD. They should make clear to China that the system is a necessary response to DPRK missile programs, while indicating that credible constraints on those programs—not vague and unenforceable pledges of restraint—could affect the future of THAAD deployments in South Korea.

Regional defenses against the Chinese missile threat will also be an important, if less urgent, issue for the review. It is an issue that preoccupies Tokyo more than Seoul, which sees Beijing in a less threatening light. Given the large size of China's medium- and intermediate-range missile arsenals, it is not feasible to defend Japanese territory against a large-scale Chinese missile attack. U.S.-Japanese missile defense cooperation should instead be directed toward protecting Japan and U.S. forces stationed there from small-scale attacks, and thereby reducing Beijing's ability to use limited strikes to intimidate or coerce U.S. allies in the region.

The future of the European Phased Adaptive Approach (EPAA) will also be addressed in the missile defense review. Since the 2010 Lisbon summit, NATO's missile defense efforts, and specifically the EPAA, have focused on protecting NATO territory from missile threats arising from outside the Euro-Atlantic security area, in particular Iran. The United States has sought to persuade Moscow that EPAA is not directed at, and does not have the capability to counter, Russian strategic forces, but Moscow rejects these explanations and continues its opposition to EPAA. The Trump administration's review may consider whether the current focus of European-based missile defenses—on Iran and not on Russia—should be altered in light of the JCPOA and the heightened threat of intermediate- and shorter-range missiles from Russia. This will be politically complicated within NATO and should proceed on the basis of thorough and sustained consultations with allies.

Implications of the JCPOA

Russia and some in the West have argued that, by eliminating the Iranian nuclear threat, the JCPOA has removed the rationale for EPAA, which, according to this view, can now be abandoned. The signatories do not agree. Iran's future nuclear intentions remain uncertain. It could decide to break out of its non-proliferation obligations and pursue nuclear weapons when key JCPOA nuclear restrictions expire after 15 years, or it could withdraw from the JCPOA or embark on a covert nuclear weapons program even sooner. Moreover, even if Tehran never revives its interest in nuclear weapons, it could still pose a conventional missile threat to Europe, a threat that grows as Iran continues to test ballistic missiles in defiance of U.N. Security Council resolution 2231. Therefore, the EPAA should not be abandoned, and the Polish site for SM-3 missile interceptors should be completed. However, if Iran were to agree to suitable restraint in its ballistic missile programs (e.g., a moratorium on flight testing of missiles capable of striking Europe or beyond), consideration might be given to an approach in which the United States and Poland would agree to complete preparation of the missile defense site in Poland but not deploy the missile interceptors, thus holding off on making the site operational.[6] If Iran were to break the flight test moratorium or violate or withdraw from the JCPOA, the site could be made operational.

Any decision to hold off on operationalizing the site in Poland—based on Iranian restraint on missile systems capable of striking Europe—should not affect U.S. missile defense cooperation with Gulf Cooperation Council countries and Israel, which is aimed at countering Iranian missiles of ranges that already threaten them.

Implications of the Heightened Russian Missile Threat

The increased Russian threat to NATO—including new ballistic and cruise missiles, both of which are capable of delivering nuclear and conventional payloads and designed to undermine NATO's will and threaten its capability to come to the defense of its Central and Eastern European members—raises the question of whether the United States and its NATO allies should alter their policy of not directing European-based missile defense assets toward countering Russia's intermediate- and shorter-range missile capabilities. We believe some alteration is required to support NATO's deterrence strategy vis-à-vis Russia. But a territorial defense of a wide range of political and economic targets against Russia's regional missile arsenal would be vastly more extensive and expensive than EPAA, would not receive the support of NATO governments, and in any event would not be effective if Russia took steps well within its financial and technical resources to defeat it. Instead, we believe the United States and its allies should consider pursuing a more limited theater

[6] To assuage possible Polish concerns, this would require advance consultations and perhaps the deployment of a U.S. military capability in Poland entailing at least as many American soldiers as would be required to man an operational SM-3 site.

defense mission that would seek to protect NATO's power-projection capabilities and reinforce NATO strategy by defending critical air and seaports of debarkation, logistics centers, and command-and-control nodes. European allies could be responsible for lower-tier systems and the United States for the upper-tier component and for point protection of its projecting forces with Patriot, Aegis, and THAAD systems. Russia would undoubtedly voice strong objections even to a more limited missile defense architecture, but the allies could make clear that the scope and timing of the NATO effort would depend on the evolution of the Russian threat. Given Russian cruise missile developments, defenses against cruise missiles will also need heightened NATO attention.

CHAPTER 5

Arms Control

Strategic arms limitation and reduction agreements with the Soviet Union and later Russia have played an important role in helping ensure an effective U.S. nuclear deterrent. They have done so by constraining the threat to U.S. strategic forces and other assets and by promoting transparency and predictability about Moscow's strategic capabilities that have enabled the United States to more confidently plan and field an effective, survivable deterrent force at substantially lower numbers than would almost certainly have been thought required in the absence of agreed limits on Soviet and later Russian forces. Strategic arms control and reduction agreements have also supported U.S. non-proliferation goals. Although U.S.-Russian measures to reduce their nuclear arsenals have had little effect—and can be expected in the future to have little effect—on North Korean (and Iranian) nuclear decisionmaking, continued progress by the two leading nuclear weapon states to fulfill their Non-Proliferation Treaty obligation to pursue nuclear disarmament can strengthen the U.S. ability to mobilize broad international support for the steps needed to reinforce the global non-proliferation regime and enhance nuclear security worldwide against theft or seizure by terrorist groups.

The 2010 New START Treaty is the latest agreement to provide these benefits, and both sides are abiding by their obligations, which take full effect in February 2018. But the outlook for arms limitation and reduction agreements with Russia is hardly optimistic. U.S.-Russian relations are at their lowest point in the post-Cold War period; Moscow seems more interested in strengthening than reducing its nuclear forces and its reliance on them; Russia maintains that any further reductions in U.S. and Russian strategic offensive forces must take into account missile defenses, conventional strike capabilities, and even third-party nuclear forces; and Russia's INF Treaty violation may be an insurmountable obstacle to Senate ratification of any new bilateral arms control deal.

Still, these challenges are all the more reason to explore means of reducing tensions and avoiding a destabilizing arms competition between the world's two most powerful nuclear-armed states. An early priority should be to implement the agreement in principle reached by Secretary of State Rex Tillerson and Foreign Minister Sergey Lavrov to resurrect the past practice of engaging in high-level, bilateral strategic stability talks. Regular bilateral consultations involving policy-level diplomats, defense officials, and military officers from both sides would provide a forum for addressing each other's strategic concerns, discussing their current differences on the components of strategic stability, and perhaps laying the conceptual groundwork for a resumption of more formal arms negotiations. These bilateral talks would complement the dialogue between NATO and Russia, recommended earlier, aimed at exploring transparency, communications, and other confidence-building arrangements that could reduce current tensions in Europe.

New START

The signatories believe continued adherence to New START is very much in the U.S. interest. At a time of tension and mistrust in the strategic relationship, the

treaty's constraints, and in particular its transparency and verification arrangements, provide a measure of stability and predictability, which is especially important now given that U.S. modernization efforts are still years away, whereas Russia is in the midst of upgrading its forces and would be in a position to ramp up quickly in the absence of treaty limits. Moreover, New START's extensive monitoring and transparency arrangements provide a window into Russian programs and capabilities that would not be available without the treaty in force—and developing additional national technical means that would provide the information provided by New START's monitoring provisions would prove hugely expensive, if feasible at all.

Although a new agreement to replace New START is highly unlikely at this stage, the Trump administration should declare that the 2013 U.S. proposal to reduce New START's ceiling of 1,550 deployed strategic warheads to around 1,000 remains on the table. In present circumstances, the Russians may well respond by reiterating their opposition to such a reduction unless non-nuclear strategic capabilities, especially missile defenses, are taken into account. Nonetheless, the reaffirmation of the U.S. proposal would send a positive signal to the international community that the United States remains willing to consider further reductions; it could help build a domestic policy consensus for needed strategic modernization; and it could provide a way forward if Moscow eventually relaxes its linkage of strategic offensive arms reductions to missile defenses and other non-nuclear strategic capabilities.

An important step that could be taken in the absence of a new agreement would be for the United States and Russia to agree to extend New START for five years beyond its scheduled expiration in 2021, as they are allowed to do under the treaty without further legislative action. The extension to 2026 would give the two parties more time, if they needed it, to get their relations back on track and consider the most promising way ahead, and it would avoid making the future of New START a political football during the 2020 U.S. presidential election. Moreover, such an extension would not preclude negotiating a replacement treaty before 2026 if political conditions allowed, nor would it prevent the United States from exercising its right to withdraw from the agreement if warranted by future Russian actions.

INF Treaty

The Trump administration and the NATO alliance will also need to address Russia's violation of the INF Treaty. With Russia already having begun to deploy ground-launched cruise missiles banned by the Treaty—and Moscow still denying that it committed a violation—prospects for bringing Russia back into compliance are small. Nonetheless, the United States should make a proposal to the Russians that would verifiably ban the deployment and further testing of the prohibited cruise missile, while addressing Moscow's allegations of U.S. non-compliance (especially its charge that the launch system for U.S. missile defense interceptors in Romania could also be used to launch INF Treaty-prohibited cruise missiles). The proposal should be coupled with an aggressive diplomatic effort to get NATO allies, Japan, South Korea, friends such as Sweden and Finland, and other countries such as China to protest the deployment of INF-prohibited missiles that could target them. Even if rejected by Moscow, such a proposal would demonstrate U.S. interest in preserving the INF Treaty, highlight Russia's non-compliance and responsibility for killing the Treaty, and help gain the support of Washington's European allies for the measures that will be necessary to respond to Russia's non-compliance.

In the likely event that Russia persists with its INF-prohibited deployments or insists on unacceptable limits on U.S. and NATO forces as the price of ending its non-compliance, the United States and its NATO partners should take appropriate countermeasures. Under present circumstances, U.S. development and deployment of its own INF-prohibited missiles is not strategically necessary, especially because the United States and its allies could pursue

sea-based and air-delivered systems that would be replies to the new Russian missiles but are not subject to INF Treaty restrictions. In any event, U.S. land-based INF systems would likely face opposition from allied publics and governments. Better responses to Russia's violation would include additional defenses against both cruise and ballistic missiles to protect NATO's power projection capabilities (along the lines suggested earlier), conventional air-delivered stand-off weapons such as JASSMs, and regular deployments to Northern European waters of U.S. warships and submarines carrying sea-launched cruise missiles (including visits by Trident guided missile submarines). Some of these steps could be reversed or scaled back if Russia came into full compliance with the INF Treaty.

Non-Strategic Nuclear Weapons

The issue of non-strategic nuclear weapons—including U.S. nuclear gravity bombs deployed in several NATO countries and Russia's much larger and more diverse arsenal of non-strategic nuclear weapons—has never been addressed in strategic arms agreements. Given Russia's large numerical advantage in such weapons, including those on Russian naval vessels, and the threat they pose to NATO, the United States and its allies have been interested in limits on Russian capabilities in this area. Moscow, however, has refused to discuss non-strategic nuclear weapons, maintaining that U.S. gravity bombs must first be withdrawn from Europe. While proposals have been advanced outside government circles for addressing non-strategic nuclear weapons—including by adopting a single aggregate limit covering all Russian and U.S. nuclear weapons, strategic and non-strategic, deployed and non-deployed—there is little prospect that such ideas will be seriously considered for quite some time. In the absence of formal arms control solutions, the Trump administration should consider less formal, confidence-building arrangements applicable to non-strategic weapons, including data exchanges on the number and types of such weapons, geographic restrictions on where they can be based (e.g., no deployment of U.S. weapons in "new" NATO countries, no Russian deployment within a certain range of NATO territory), and prohibitions on the mating of non-strategic nuclear weapons to their delivery systems.

Missile Defense

Missile defense is likely to remain a difficult issue in U.S.-Russian strategic discussions. Although Moscow is pursuing its own missile defense programs, it fears U.S. technological advantages in this area. It has voiced strong opposition to U.S. homeland and regional missile defense plans, including the EPAA. After the two sides failed in 2011 to reach agreement on a cooperative missile defense plan for Europe, the Russians called for a legally binding agreement—including limits on the numbers, velocities, and locations of interceptor missiles—that could provide assurance that U.S. missile defenses will not pose a threat to their strategic capabilities. The Obama administration rejected such a legally binding measure.

The Trump administration should consider reaffirming a 2013 U.S. offer of a bilateral executive agreement on missile defense transparency. Under the executive agreement, the two sides would exchange annual declarations providing the number of key missile defense elements (e.g., interceptors and radars) they currently possess and projecting those numbers for each year over the following 10 years. The goal would be to provide sufficient information so that each side would recognize that the other's missile defenses did not threaten its strategic offensive forces or, at a minimum, would have years of warning during which it could act if it saw a threat emerging. Although the Russians did not accept the 2013 proposal, they may adopt a more realistic approach once they recognize they cannot derail EPAA and if they conclude that such a transparency arrangement would at least give them a better window into what they fear could be a Trump administration plan to significantly ramp up U.S. missile defenses.

Ban Treaty

On July 7, 2017, multilateral negotiations under the auspices of the United Nations resulted in the Treaty on the Prohibition of Nuclear Weapons, which was adopted with the affirmative votes of 122 nations. The ban treaty was opened for signature on September 20, 2017, and will enter into force 90 days after 50 states have ratified it. There is little reason to doubt that 50 countries will quickly sign and ratify the treaty. However, no current nuclear-armed states participated in the negotiations or the vote; neither did non-nuclear weapon states that rely on U.S. extended deterrence commitments (with the exception of the Netherlands, which participated in the negotiations but cast the only negative vote). The treaty prohibits its parties from developing, testing, producing, possessing, stockpiling, transferring, using, or threatening to use nuclear weapons. Parties are also banned from allowing other states to station, install, or deploy nuclear weapons on their territory. States that currently possess nuclear weapons have the option either to destroy their stocks before joining the treaty or to join and begin a timebound disarmament process.

Given opposition to the ban treaty by current nuclear powers as well as by the so-called "umbrella" states, the treaty will not serve its declared objective of accelerating nuclear disarmament. The nuclear powers and other ban treaty opponents maintain that progress in disarmament can best be made through a step-by-step process as political conditions permit.

The group believes that the Trump administration should oppose the ban treaty. It should make clear, as a legal matter, that the treaty only limits parties that adhere to it and cannot purport to create a new "customary" international law norm. In coordination with other states, it should seek to ensure that the new treaty does not in any way undermine, alter, or replace the NPT as the established international non-proliferation regime. The administration should also work with allies and friends to counter attempts to use the ban treaty as a platform for undermining public support for burden-sharing and extended deterrence in Western democracies. At the same time, the administration should look for ways to engage with countries that negotiated the ban treaty, explain U.S. policy, and signal that it understands the concerns that motivated the conclusion of the treaty, with the objective of defusing this difference in the run-up to the 2020 Non-Proliferation Treaty Review Conference.

Nuclear Testing

The Trump administration is unlikely to share the Obama administration's strong support for early ratification of the Comprehensive Nuclear Test Ban Treaty (CTBT). But the United States has not conducted a nuclear test in over 25 years, and there is no persuasive reason for it to resume nuclear testing, which would open the door to a resumption by other nuclear powers and undermine U.S. leadership in seeking to build international support for addressing non-proliferation challenges such as North Korea and Iran. Directors of U.S. weapons laboratories and the commander of STRATCOM (Strategic Command) have repeatedly certified that the U.S. nuclear stockpile remains safe, secure, and reliable without nuclear testing, and there is no currently foreseeable requirement to test new weapons designs. The laboratory directors also point out that the Stockpile Stewardship Program has resulted in a better understanding of how U.S. nuclear weapons operate and age. The Trump administration should therefore state its intention to continue abiding by the current testing moratorium, continue supporting funding for the CTBT Organization's International Monitoring System, and avoid formal steps, such as "unsigning" the CTBT, that would call into question the eventual ratification and entry into force of the treaty. The administration should also consider joining with other avowed former testing powers (China, France, India, Pakistan, Russia, and the U.K.—but not North Korea, whose testing is illegitimate because it results from violating the NPT and should be addressed separately) in a joint political commitment to continue their testing moratoria for at least another 10 years.

The Goal of Complete, Global Nuclear Disarmament

In the course of its Nuclear Posture Review, the Trump administration may address the goal of a world without nuclear weapons. Whatever administration officials may think about the likelihood or desirability of achieving that goal, it would make little sense to walk away from a position that both Republican and Democratic administrations have taken for decades, regardless of whether or not they thought it was an achievable goal. A departure from long-standing U.S. support for the ultimate goal of nuclear disarmament would needlessly damage the U.S. reputation for global leadership in reducing nuclear dangers, exacerbate existing divisions among NPT parties and increase the difficulty of advancing nuclear non-proliferation and nuclear security objectives, and give impetus to efforts such as the ban treaty to delegitimize nuclear deterrence.

CHAPTER 6

Conclusions

Today's most pressing challenges to U.S. deterrence goals come not from the threat of massive nuclear attack against the U.S. homeland but from the possibility that nuclear-armed adversaries will seek to exploit local conventional military advantages and the threat of escalation to the nuclear level to act more aggressively in their regions and prevent the United States from coming to the defense of its allies and partners. A key U.S. priority at the present time must therefore be to reinforce deterrence at the regional level, including deterrence of possible aggression by Russia, North Korea, or China against their neighbors.

Reinforcing regional deterrence should focus heavily on U.S. and allied conventional capabilities—including missile defenses, precision strike systems, and non-kinetic tools—that can prevent aggressors from achieving a rapid, low-cost *fait accompli* and ensure, despite a challenging anti-access, area denial environment, that the United States can expeditiously reinforce exposed allies in a crisis and defeat the adversary's conventional attack.

Reinforcing deterrence at the regional level also means maintaining the credibility of the U.S. extended nuclear deterrent, both to deter potential foes and assure allies. It is essential to make clear to potential adversaries that initiating the use of nuclear weapons in the midst of a conventional conflict would involve overwhelming and unacceptable risks. In both Europe and Asia, long-range strategic forces provide the backbone of extended nuclear deterrence and assurance in combination with theater nuclear capabilities. In Europe, the U.S. forward-based nuclear posture will be strengthened with the completion of the B61-12 life extension program by 2024 and modernization of NATO's dual-capable aircraft and will continue to demonstrate alliance burden-sharing and resolve. In Northeast Asia, a combination of U.S. central strategic systems (including the deployment of strategic bombers in Guam) and forward-deployable, dual-capable fighter-bombers can serve to deter potential adversaries and assure allies, and can be augmented by more persistent stationing of U.S. strategic assets in the region as conditions warrant. Moreover, the Trump administration should be responsive to Japanese and South Korean interest in playing a more prominent role in the extended deterrent.

The credibility of regional deterrence depends not just on fielding effective conventional and nuclear capabilities. It also depends on signaling to potential adversaries—through firm and consistent declaratory policies, regular and close alliance consultations, frequent joint military exercises, and timely fulfillment of national force-level and budgetary commitments—that the allies have the unity and will to defend their security.

While working to strengthen the components of regional deterrence, it is also essential to maintain the effectiveness of U.S. central strategic systems, which underwrite deterrence at the regional level as well as deter threats to the U.S. homeland. The priority on central strategic systems is to proceed with modernization—not just of the Triad but also of the enabling and support capabilities that are vital to a credible deterrent. The scale, composition, and

timing of U.S. Triad replacement programs could be affected by such factors as changes (positive or negative) in the threat environment, developments in adversary offensive and defensive programs, cost and budgetary considerations, and possible future arms control agreements.

In addition to endorsing modernization of the U.S. central strategic systems, the signatories believe the Trump administration's strategic reviews should focus on such questions as the size and role of the future U.S. ICBM force (including whether the current approach to LUA should be retained); the extent to which the LRSO provides value-added in penetrating air defenses and meeting regional and global deterrence requirements; whether the United States should resurrect the nuclear-armed Tomahawk sea-launched cruise missile; whether it should design and build new prototypes of nuclear weapons; the size and composition of adversary target bases that U.S. forces should hold at risk; the contribution of conventional strike systems to deterrence; and the role and scale of U.S. regional and homeland missile defenses. Every new administration has an obligation to ask and answer such questions about the U.S. strategic posture.

In conducting its reviews, the Trump administration should be conscious of the importance of not giving potential adversaries incentives to further build up their strategic or non-strategic capabilities or, in the event of a crisis or confrontation, to initiate the use of force, especially the use of nuclear weapons. While making clear its determination to take whatever steps are necessary to protect itself and its allies, including from third parties like North Korea, the United States should seek ways to address Chinese and Russian concerns about the implications of such steps for their security in an effort to manage the challenges of strategic stability cooperatively. In the case of North Korea, the United States should avoid needlessly arousing DPRK concerns about pre-emptive attack or regime change and, in a crisis, it should signal clearly that North Korean restraint would be reciprocated by the United States, while emphasizing that North Korean escalation, especially to the nuclear level, would have grave consequences for the survival of the regime.

By constraining the threat to the United States and U.S. strategic forces and promoting a more transparent and predictable strategic environment, arms limitations and reduction agreements can contribute importantly to U.S. deterrence and assurance goals. While new formal arms control agreements with Russia are unlikely under current circumstances, New START should be preserved, and early agreement should be reached to extend it for five years. In addition, the Trump administration should consider confidence-building arrangements to address Russian advantages in non-strategic nuclear weapons, a bilateral transparency measure with Moscow on missile defense plans, and a multilateral joint statement on continuing existing moratoria on nuclear testing. It should make a proposal to bring Russia back into compliance with the INF Treaty and work with U.S. European allies on appropriate countermeasures that could provide leverage to bring Russia back into compliance or, failing that, would deny Russia any meaningful military advantage from its INF-prohibited, ground-launched cruise missile. And the administration should continue long-standing U.S. support for the goal of a world without nuclear weapons, even if that goal is not achievable in the foreseeable future.

Effective U.S. deterrence policies and plans must be sustainable over the long-run. High-cost investments in strategic programs and related infrastructure span decades and require stable funding and steady political support. A start-and-stop approach to deterrence will not work. Therefore, achieving and maintaining a bipartisan, national consensus on deterrence programs and policies—one that can survive political transitions—is critical. Such a consensus requires a balanced approach that has wide appeal across the political spectrum. It must combine a strong commitment to maintaining a modern, safe, secure, reliable, and effective U.S. nuclear deterrent with a continuing commitment to reducing the numbers of, and reliance on, nuclear weapons. It must balance efforts to modernize U.S. strategic capabili-

ties and strengthen deterrence with further efforts to promote stability and reduce nuclear dangers. So, although the international security challenges the United States currently faces call for immediate attention to enhancing the capabilities needed to ensure effective deterrence at both the regional and global levels, the Trump administration should pursue a balanced approach to strategic issues that can achieve a broad consensus that is sustainable over the long term.

Annex 1: Signatories

The following are signatories to this report. Note that institutional affiliations are for identification purposes only and not intended to signal institutional endorsement of this report.

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William J. Burns
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Atlantic Council, Former Under Secretary of Defense for Policy

Strobe Talbott
President, The Brookings Institution

Jon B. Wolfsthal
Senior Advisor, Global Zero

Annex 2: Individual Perspectives

Certain signatories have included short individual perspectives on certain issues raised in this report, which are included below.

James M. Acton

This report represents a timely, credible, and serious attempt to define an effective nuclear posture for the United States, and I am pleased to endorse it. Critically, it recognizes that for policy in this field to be implemented sustainably, bipartisan support is essential, and that such support requires efforts to reduce nuclear risks alongside those to bolster nuclear deterrence. Those concerns that I do have largely relate to priorities and emphasis.

First, I associate myself with the comments of my colleague, George Perkovich, about the dangers of focusing too heavily on nuclear weapons at the expense of other tools of national power, and about the importance of good faith efforts to create the political and security conditions that would facilitate the eventual abolition of nuclear weapons.

Second, while the report recognizes that is in the security interests of the United States and our allies that Russia and China do not believe that we seek to negate their nuclear deterrents, its recommendations on this score are insufficiently proactive. To be sure, Beijing and Moscow did not help themselves when they rejected offers of dialogue and confidence-building from the Obama administration. Nonetheless, renewed efforts at engagement are in our own interests. For example, while I agree that the United States should not publicly acknowledge mutual vulnerability with China immediately, I do believe that Washington should emphasize to Beijing that such an acknowledgement could be the outcome of a confidence-building process in which China committed to take reciprocal actions. In the meantime, an unacknowledged assumption of mutual vulnerability should underline U.S. planning and procurement efforts. The Trump administration should also be more proactive on confidence-building with Russia. It could, for example, renew the Obama administration's offer to allow Russia to measure, with its own equipment, the burn-out speed of the missile defense interceptors being installed in Europe as a way to demonstrate that they do not threaten Russian ICBMs.

Linton Brooks

I support the overall thrust of the report and believe it is a useful guide for the ongoing Nuclear Posture Review. Because I was unable to take part in the discussions and drafting, there are three consensus areas with which I do not agree:

- The report states that weapons complex modernization "will" reduce the number of non-deployed weapons required for a technical or geopolitical hedge. This is overly optimistic. The National Nuclear Security Administration proposes producing 50-80 pits per year by 2030. At 80 pits per year it would take five years of production to increase the number of ICBM warheads from one to two per missile. It would take six more years to produce enough pits to fully load 10 SSBNs with eight warheads per missile, assuming they deploy with the average of five warheads envisioned by New START. I strongly support complex modernization but it cannot be depended on for an adequate hedge.

- Negotiating the proposed 10-year, politically binding moratorium on nuclear testing will be a distraction that will provide no political or non-proliferation benefit and will only highlight U.S. failure to ratify the Comprehensive Nuclear Test Ban Treaty.

- The report consistently describes the program of record as 12 Columbia-class SSBNs, 400 deployed ICBMs, and 80-100 B-21 bombers. Nowhere does it note that the majority of the B-21 force will not be assigned nuclear missions or that the deployment of the Columbia-class

will result in an over 40 percent reduction in the maximum number of SLBM launchers available.[7] Overstating the force resulting from the existing program does not facilitate sound discussion and debate.

The report identifies several areas of disagreement among participants. I support retaining the Triad in order to complicate Russian strike planning. I support deploying the Long-Range Stand-Off (LRSO) missile to maintain the effectiveness of the air-breathing leg of the Triad, as the current air-launched cruise missile becomes unable to deal with modern air defenses. This will be especially important if the nuclear portion of the B-21 program is delayed. I am skeptical of the need for a nuclear, sea-launched cruise missile, but if one is to be deployed it should be a new missile based on LRSO technology. The best argument for LRSO is that the existing air-launched cruise missile will no longer be able to penetrate modern air defenses. It is illogical to assume that a similar-sized, sea-launched cruise missile from the same era will not face similar problems.

George Perkovich

I fully endorse the conclusion of this report and commend its authors. In doing so, I underline the primary need to "focus heavily on U.S. and allied conventional capabilities … that can prevent aggressors from achieving a rapid, low-cost *fait accompli*…" Effective extended deterrence also requires alliance solidarity in maintaining equitable democratic governance and countering foreign subversion, including from information operations. I say this here due to concern that emphasizing nuclear deterrence may distract attention from harder-to-achieve reforms that the U.S. and its allies need to pursue.

In framing the nuclear policies recommended in this report, the U.S. and its allies can advance their own and many other countries' interests by explicitly seeking to create conditions for the steady reduction of the role of nuclear weapons in international politics and the implementation of verifiable and enforceable nuclear disarmament. The 2017 Treaty on the Prohibition of Nuclear Weapons does not adequately address these requirements; the U.S. and its allies should do so.

I support this report also because it reflects a now-rare spirit of bipartisanship and willingness to compromise on particular issues in order to constructively address larger national and international requirements. Democracy requires this.

I have two specific reservations with the report. It wisely recognizes that it would be futile and counter-productive for the U.S. to seek, or to be plausibly perceived to seek, to negate China's second-strike nuclear deterrent. But it then concludes, problematically in my view, that "public acceptance of mutual vulnerability would not be advisable." U.S. regional allies, ultimately, must be encouraged to understand that the retention of nuclear first-use options in the most ominous possible conflict scenarios is paired with the reality that China will retain the capability to respond by inflicting massive destruction on the U.S. Responsible American leaders will (or should) think and act accordingly. This should drive the U.S. and its regional allies to bolster diplomatic and non-nuclear capabilities to motivate Chinese leaders to eschew escalatory actions.

Finally, I think more care must be given in advising the U.S. to use "precision-guided conventional strike systems to hold at risk such infrastructure targets as power plants, oil refineries, transportation hubs, and communication nodes" in Russia. I do not believe conducting such attacks would be advisable prior to the first use of nuclear weapons by Russia against U.S. or allied targets. Prior to Russian nuclear first-use, I believe the U.S. should confine its use of what would be perceived as strategic conventional (or cyber) strikes to clearly military targets.

[7] The 12 Columbia-class SSBNs will have 16 tubes per ship compared to 24 on the 14 existing Ohio-class SSBNs.

Walter B. Slocombe

I add this comment on the concept that the U.S. "should ... pursue" integrating conventional strikes into nuclear planning because it "could reduce to some extent the numbers of nuclear weapons required." There may be situations in which it is appropriate—presumably in a regional context—to have an option to link a sharply limited nuclear strike with a more comprehensive conventional campaign. However, if the issue is using conventional weapons as significant elements of a large-scale nuclear response, I have my doubts. Before pursuing any such effort, it is important to bear in mind that any target that would be struck with a nuclear weapon in plans drawn up under current practices is by definition one whose destruction is highly important, and perhaps essential, to achieving the desired damage levels or enabling other weapons to do so (taking into account uncertainties of the effectiveness even of nuclear weapons). No doubt new technologies have improved and will continue to improve conventional weapon effectiveness, but it is not clear that the damage expectancies will ever equal those of nuclear weapons. Adopting such an "integration" policy could therefore have very little effect on the total number of nuclear weapons needed in a given plan (though increasing the scale of the total effort). In any case, the rhetoric associated with advertising the concept would certainly tend to validate Russian complaints that the U.S. long-range precision weapons are part of a U.S. plan for eliminating the Russian deterrent and raise allied doubts about the strength of the U.S. commitment to extended deterrence.

Jon B. Wolfsthal

The preferred way for the United States and the Russian Federation to reduce their nuclear arsenals is through verifiable, binding reduction agreements that are faithfully implemented. However, the United States should be able to pursue adjustments to its forces to enhance its security without having to move only in tandem with Russia. As long as the United States maintains the forces necessary to deter our adversaries and reassure our allies, additional reductions should not be subject to a Russian veto. Moreover, given Russia's abdication of its responsibilities to reduce nuclear weapons and preserve strategic stability, the United States may be able to advance its own global leadership and put pressure on Moscow through unilateral actions, especially if the United States possesses more weapons than needed for deterrence and reassurance, as is currently the case.

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