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Risk of Nuclear Use

1. The overall risk of nuclear use is still very low. However, at least two factors are making that risk greater. One is the growing nuclear competition among some nuclear weapons states, especially the United States, Russia, and China. The United States believes that Russia and China have moved towards a policy of using nuclear weapons first and early in a conventional war. There are reasons why the United States believes so, but Russia and China view this as a major U.S. misunderstanding of their policies, or worse, a deliberate U.S. effort to misportray their policies. Particularly in China, many Chinese experts believe that China has systematically implemented the unconditional no first use policy in its military operational doctrine, trainings, and exercises. Therefore, Russia and China tend to reject the U.S. argument that the U.S. efforts to re-emphasize the role of low-yield tactical nuclear weapons are aiming at deterring limited nuclear use by other countries. Instead, Russia and China generally conclude that the United States actually intends to develop nuclear warfighting capabilities and to intentionally lower the threshold of nuclear use. Such interpretations of the U.S. intention could drive these countries to respond by developing their own capabilities and readjusting their nuclear postures in ways that emphasize rapid response and flexible nuclear employment options. All those measures could increase the chances of nuclear use.
2. There is also the risk of nuclear use by nuclear newcomer states, not necessarily as a result of an aggressive intent but by incident or misunderstanding. DPRK, in particular, has just acquired a rudimentary nuclear capability and it generally embraces a strategy of military brinksmanship. Based on the historical experience of other nuclear armed states, it is quite likely that the North Korean leaders' current understanding of nuclear weapons is very preliminary, especially with regard to the concept of deterrent, the risk of inadvertent escalation, the complexity of nuclear signaling, and the limits of using nuclear threats to achieve foreign policy objectives. The international community has so far been reluctant to engage with North Korea on nuclear weapons issues except on denuclearization. That has limited the international community's capability to "educate" DPRK about safe and secure nuclear practices, about how to avoid adopting risky and destabilizing nuclear postures, and about how to minimize risks of misunderstanding and overreaction in a military crisis.

The INF Treaty

3. The possible termination of the INF treaty threatens the survivability of the New START and of today's overall nuclear arms control regime. The growing U.S. concern about China's INF missiles contributes to the U.S. withdrawal decision. Although both Washington and Moscow voiced interests to pursue an expanded INF framework, the prospects for China to join the INF or some modified version of the treaty seem quite low at this moment. China views its INF missiles critically important to its capability to deter a future U.S. military intervention over Taiwan and in other regional security issues that are at the core of China's territorial integrity and national security. China also perceives itself as

possessing a uniquely superior military capability in this area and seems relatively confident of its long-term potential to outcompete the United States in a post-INF world. Chinese experts widely interpret the U.S. withdrawal decision as an official declaration of an all-out military competition with and containment against China. They generally attribute the U.S. decision to a perceived shift of U.S. policy towards greater hostility against China. Under such circumstances, the option of exploring arms control cooperation with the United States is anything but popular among the Chinese expert community.

4. The bilateral distrust is growing and the level of security dilemma sensitivity is low, which means that any U.S. efforts in the future—or even simple domestic discussions in the United States—to explore options of developing and deploying INF missiles in the Asia-Pacific region would likely cause worst-case scenario thinking and reaction in Beijing. The risk of an intensified regional missile competition is very real.

Nuclear Modernization and Disarmament

5. Every nuclear armed state conducts nuclear modernization to maintain the safety, security, and reliability of its nuclear deterrent. However, in many cases, nuclear modernization has led to greater counterforce strike capabilities, such as the enhanced accuracy of missiles, upgrade of fuses to optimize warhead detonation height, and more advanced missile retargeting capability enabled by better computer systems. From the enemies' perspective, such improvements make their deterrent forces more vulnerable and contribute to one's inclination towards conducting preemptive strikes against them. This is one of the reasons that one country's nuclear modernization can cause concerns and thus cascading reactions in adversarial countries. In the end, modernization begets more modernization. Russia and China believe the Trump administration's nuclear modernization program is introducing new warfighting capabilities such as low-yield tactical nuclear weapons; thus, those conservative voices in these countries who would like their countries to follow suit have become louder.
6. Nuclear modernization is also a process that strengthens parochial bureaucratic interests and reinforces entrenched beliefs within nuclear armed states. In many of these states, the distribution of the nuclear responsibility to multiple military services leads to embedded interests in all these military branches to constantly advocate for growing investment in and expanding role for the types of nuclear weapons they operate. Within the national nuclear industrial and military communities, after generations of nuclear scientists, weapons operators, and policy-makers and -practitioners have devoted their lives to the maintenance of credible nuclear arsenals, perceptions towards nuclear weapons get shaped in ways that cannot be easily changed. The appreciation of the importance of nuclear deterrent becomes part of the collective DNA. When some states initially acquired nuclear weapons a few decades ago, their leaders seemed to be genuine believers of nuclear disarmament; however, as time goes by and nuclear modernization continues into the infinite future, today's leaders have got used to enjoying the security benefits from nuclear weapons and no longer seem capable of imagining how they could safeguard their national security without them. In the long run, this undermines the prospects of disarmament.
7. Furthermore, when conducting nuclear modernization, decision-makers sometimes focus predominantly on the goal of building and maintaining effective

and credible nuclear deterrent forces, and pay far less attention on how some of the modernization programs could increase the risk of nuclear use and negatively affect crisis stability. For example, the development of dual-capable systems (such as missiles that can accommodate both nuclear and conventional warheads), the co-location of nuclear and conventional weapon systems, and the entanglement of the command, control, and communication systems for both nuclear and conventional purposes, etc., can all create risks of misunderstanding, misjudgment, and inadvertent escalation during a crisis. Such issues exist widely in nuclear armed states and have not received sufficient attention in their nuclear modernization planning.

New Technologies

8. New non-nuclear technologies greatly undermine the stability of mutual deterrence relationships between nuclear armed states. These technologies include but are not limited to missile defense, conventional precision strike weapons (including hypersonic weapons), advanced space-based sensors and surveillance technologies, cyber weapons, AI technology, and unmanned systems. Different from the Cold War era, today's non-nuclear technologies can potentially threaten an enemy's nuclear second strike capability. Because of the deep distrust between nuclear rivals, countries that fear they might become targets of these non-nuclear weapons tend to employ worst-case scenario thinking when they evaluate the impact of such technologies on their nuclear deterrent. Therefore, there are large perception gaps between target countries and possessor countries over how threatening such technologies are to nuclear weapon systems and over how much additional nuclear modernization the target countries should justifiably conduct to address the perceived threats from such technologies.
9. The need is urgent to conduct systematic, in-depth, and sustainable dialogues on the impact of such new technologies to manage the perception gaps. Otherwise, strategic stability between nuclear rivals would be increasingly harder to maintain and a more intense nuclear competition could follow. Dialogues to build shared understandings on the impact of such technologies should start at the expert level, especially among technical experts who share a common language of science and can help keep the discussions substantive, deep, and less politicized.

The Ban Treaty

10. Despite the often-heard criticisms towards the Treaty on the Prohibition of Nuclear Weapons (Ban Treaty), I believe the Treaty plays a very important role in highlighting the importance of the humanitarian perspective for the disarmament debate and in reducing the prestige and legitimacy of nuclear weapons. The arguments of the nuclear armed states in opposing the Treaty are not without flaws. The United States, for example, rolled out the Creating the Conditions/Environment for Nuclear Disarmament initiative as a more viable approach than the Ban Treaty. However, the initiative focuses exclusively on how the current international security environment should be improved first (and thus the right conditions be made) before nuclear disarmament could take place. It downplays the effect of the continuous existence of nuclear weapons on complicating the international security environment. Today's nuclear arsenals spread across many of the most volatile regions in the world, and they seem to have contributed to the exacerbation of existing regional tensions and interstate

hostilities.

11. For instance, China's concern of possible U.S. interests in seeking to neutralize its nuclear deterrent has been a major source of Beijing's strategic distrust against Washington. That concern caused decades of bilateral disputes around the U.S. development of missile defense and conventional hypersonic strike weapons and has contributed to deeper mutual suspicions in their political relationship. Sometimes those disputes spilled beyond their borders and greatly worsened regional security environment, as the 2016 dispute over the U.S. deployment of the THAAD missile defense system in South Korea demonstrated. For decades, to secure the credibility of its nuclear second strike capability has been a key priority of China's military modernization and an important driving force of China's growing investments in both nuclear and related conventional military capabilities. All these nuclear and conventional military modernizations then cause other neighboring countries to worry about their security and to take countermeasures.
12. This is one simple example of an important effect: the continuous existence of nuclear weapons creates at least as many security problems as it seems to solve; it very much complicates—and in many cases worsens—the international security environment, not to mention its role in encouraging additional nuclear proliferation by more countries. Nuclear weapons and the international security environment have mutual impact on each other. Seeking to improve the situation by addressing only one part of an interactive relationship is like a dog chasing its own tail. The international security environment would never be ready for disarmament, if the international community did not also address our habitual obsession with nuclear weapons head on.
13. Although nuclear armed states generally agree with the eventual goal of disarmament, there are inherent limits to how much they could move towards that goal. Embedded interests and entrenched beliefs are some of these inherent limits that are hard to overcome. Just as one cannot lift oneself up, nuclear armed states have intrinsic shortcomings to disarm themselves. In this sense, external pressure is useful and necessary, and the Ban Treaty provides such an external pressure. For those who would like to promote disarmament, the Ban Treaty works as a reminder that efforts need to be made simultaneously on improving the international security environment and on making countries less reliant on nuclear weapons.

The P5 Process

14. One important deliverable of the 2019 Beijing P5 meeting is an agreement to start the Phase II of the nuclear glossary project. Although it is a meaningful endeavor to continue building common understandings on concepts and terminology, it shows the limited capacity of the P5 process to generate progress on more substantive issues. There was little agreement on nuclear reduction or greater transparency; even on less controversial/sensitive issues, such as the joint development of nuclear disarmament verification methodology and technology, the P5 could not work together, as evidenced by the lack of joint participation in the International Partnership for Nuclear Disarmament Verification.
15. At the Beijing meeting, the P5 again spoke strongly against the Ban Treaty and

did not identify concrete measures to address the division between nuclear weapons states and non-nuclear weapons states on the issue of disarmament, although this division has become one of the greatest threats to the NPT nonproliferation regime. When it comes to disarmament, the P5 process functions as a solidarity effort among the nuclear weapons states, helping them jointly push back against the disarmament pressure from non-nuclear weapons states. If not for the P5 solidarity, I doubt some of the individual nuclear weapons states would have felt so comfortable in so strongly and categorically denouncing the Ban Treaty and the underlying efforts of other members of the international community in promoting disarmament.

16. That said, the P5 process is not useless. In fact, it should become more important in the future, not in the area of promoting disarmament, where it failed to generate progress, but in the area of managing growing nuclear tensions among themselves. At least among the United States, Russia, and China, the risk of a more intense nuclear competition is growing, against the background of fast rising strategic competition and political hostility. A private communication channel among the nuclear weapons states such as the P5 process can provide unique benefits in promoting more candid discussions and in-depth exchanges, on issues of maintaining strategic stability among themselves.
17. To achieve this objective, however, the P5 process really needs to emphasize the importance of having substantive discussions. They should not hope that they could address their disagreements and build common views on complex nuclear doctrine and policy issues, which are often entangled with sophisticated technical issues, simply through occasional and brief meetings of their foreign ministry officials. The process needs to have designated working groups or joint research projects, to be attended by policy and technical experts, to look deeply into substantive issues including the sources of their disagreements and possible ways to mitigate them.

Role of the UK

18. The UK has played a leadership role in global nuclear diplomacy, especially in promoting disarmament and nonproliferation. Its own nuclear reductions set an example for others. Looking into the future, the UK can make more contributions to preventing the expansion of the role of nuclear weapons in the world and to keeping the threshold of nuclear use from becoming lower. In this regard, promoting wider domestic and international appreciation and acceptance of minimum deterrent doctrine, “sole purpose” posture,¹ and/or no first use commitment is useful. An international discussion is also urgently needed to understand the potential challenges to international security from new non-traditional nuclear weapon systems that are under development, such as long-range nuclear torpedoes and nuclear-powered nuclear-armed cruise missiles. Moreover, a multilateral (such as the P5) or international discussion on the risks of the entanglement of nuclear and conventional military systems would be useful for reducing the risk of inadvertent nuclear use in conventional conflicts.
19. The UK can promote discussions among the nuclear armed states to build

¹ The “sole purpose” posture is to declare the sole purpose of one’s nuclear weapons is to deter a nuclear attack.

common understandings about the impact of new non-nuclear technologies (such as missile defense) on nuclear weapon systems. The lack of such common understandings poses the greatest threat to future strategic stability. A lot of substantive work is needed to build such common understandings, among both technical and policy experts of the nuclear armed states. The UK is not as deeply embroiled as some other nuclear armed states in their struggles over the impact of new non-nuclear technologies, and is thus in a good position to facilitate such discussions.

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