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TOWARDS GREATER NUCLEAR RESTRAINT: RAISING THE THRESHOLD FOR NUCLEAR WEAPON USE

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SUMMARY

● This report focuses on the risks that a lack of nuclear restraint pose for international security. One the one hand, the problem has to do with uncertainty regarding the first use of nuclear weapons, which has increased in recent years as a result of technological developments, political tensions, and the deadlock in nuclear arms control. One the other hand, there is a longer-term trend of a lowering nuclear threshold in response to WMD proliferation threats by non-nuclear weapon states. After identifying some of the most problematic aspects of the current nuclear policies of the five nuclear weapon states (NWS), the report makes the case for greater restraint, including recommendations for reducing doctrinal ambiguity and more credible assurances that the threshold for nuclear weapon use remains high. The report also seeks to provide conceptual tools for a broad international dialogue on nuclear doctrines, based on a recent agreement by the NWS to pursue such dialogue in the 1968 Treaty on the Non-Proliferation of Nuclear Weapons (Non-Proliferation Treaty, NPT) context.

I. Introduction

The effectiveness of nuclear deterrence essentially depends on a state convincing an adversary of its own readiness to use nuclear weapons. To be stable, however, deterrence relationships also depend on the exercise of the utmost restraint with regard to the actual use of nuclear weapons. Maintaining this delicate balance involves a number of risks, not least the accidental use of nuclear weapons and the possibility that the threat of use might fail to deter an adversary. There are also specific risks related to a real or perceived lack of restraint regarding the use of nuclear weapons. This report focuses on the latter types of risks, which are currently highlighted in connection with concerns that the threshold for nuclear weapon use in the two major nuclear weapon states (NWS) might be lowering.

In recent western debates, concerns about a lowering of the threshold for nuclear weapon use have focused particularly on Russia's so-called escalate to de-escalate doctrine, the existence of which has been denied by Russia. Despite US statements to the contrary, development by the United States of new low-yield nuclear weapons that seek to counter that perceived threat can similarly be seen as lowering the threshold for nuclear weapon use. Moreover, Russia and China have for a longer period been concerned about what they see as an emerging US capability for preventive nuclear strikes with the help of missile defences and advanced conventional weapons. Both states have sought to hedge against this perceived threat by strengthening their strategic deterrence capabilities.

All these developments reflect increasing uncertainty regarding the threat of first use of nuclear weapons, which has already fuelled new armament dynamics. While the possibility of first use has always challenged the assumption of strategic stability based on nuclear deterrence, today such concerns are heightened by technological developments and the resurgence of political tensions between the major NWS. This uncertainty has been further accentuated by the erosion of the US–Russian nuclear arms control architecture, leading to a loss of transparency, verification mechanisms and channels of communication between the two largest NWS.

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In addition to increased uncertainty regarding first use among the NWS, some of them have also reserved the right to use nuclear weapons against states that are not compliant with their international non-proliferation commitments, and expanded the role of nuclear weapons in military planning over the past two decades to address scenarios involving chemical and biological threats, and even cyberattacks. This, in turn, has reduced the threshold for nuclear weapon use against non-nuclear weapon states (NNWS).

While there is no way to definitively predict whether or how the threshold for nuclear weapon use might be crossed, the doctrines and capabilities of the NWS provide important information about their level of nuclear restraint. Given the enormous risks related to nuclear weapon use, any signals of weakened restraint are bound to raise serious concerns. In addition to the potentially increased likelihood of nuclear weapon use by a given state, mere perceptions about such lack of restraint by others can create instability by incentivizing further armament development and raising alert levels.

This report analyses the most likely scenarios for intentional nuclear weapon use based on existing doctrines and capabilities, and the prevailing threat perceptions of the five NWS—China, France, Russia, the United Kingdom, and the USA—which are also the five permanent members of the United Nations Security Council (the P5). It identifies some of the most problematic aspects of their current nuclear policies and makes the case for greater nuclear restraint. It also proposes practical measures for addressing contemporary concerns about the lowering threshold for nuclear weapon use. While the main focus of the report is on Russia, the USA and the rest of the P5, some of the recommendations also apply to those nuclear-armed states that are outside of the 1968 Treaty on the Non-Proliferation of Nuclear Weapons (Non-Proliferation Treaty, NPT).[1]

Given the enormous risks related to nuclear weapon use, any signals of weakened restraint are bound to raise serious concerns

In addition to a general appeal for greater restraint in nuclear weapon policies, the report seeks to provide conceptual tools for a broad international discussion on nuclear doctrines, building on the P5 agreement in January 2019 on a process to 'enhance dialogue on nuclear policies and doctrines'.[2] The report partly overlaps with the nuclear risk reduction literature, with the distinction that the focus below is mainly on doctrines and other aspects of declaratory policy, which places risks related to accidental or unauthorized use beyond the scope of the analysis. In addition to the risk of nuclear weapon use, the report also considers the risks that the lack of nuclear restraint pose to strategic stability.

[1] The five nuclear-armed parties to the NPT, or NWS, are China, France, Russia, the UK and the USA. India, North Korea and Pakistan are not parties to the NPT, and are therefore not recognized as NWS by the treaty. Israel—which is also not a party to the NPT—refuses to either confirm or deny its possession of nuclear weapons.

[2] Third Session of the Preparatory Committee for the 2020 NPT Review Conference, Statement by Fu Cong on behalf of the P5 states, 1 May 2019, New York.

II. The threshold for nuclear weapon use: Current doctrines, capabilities and threat perceptions

Nuclear deterrence is premised on the assumption that the threat of the enormous destruction unleashed by nuclear weapons will effectively prevent aggression by others, so the threat never has to be carried out in practice. Retrospectively, many have viewed the absence of direct confrontation between major powers during the cold war as a confirmation of this assumption, suggesting that nuclear deterrence has a stabilizing effect on international security. However, the 'nuclear peace' theory tends to discount the risk of technical and human error, and to assume that nuclear-armed states will always exercise the utmost restraint by both being deterred by and refraining from nuclear weapon use except in extreme circumstances. In effect, the theory tends to restrict the conceivable scenarios for nuclear weapon use to a retaliatory second strike.[3] In reality, the assumed stability created by nuclear deterrence has always been undermined by the possibility of a first use of nuclear weapons.[4]

This section considers the different scenarios for intentional nuclear weapon use based on the current nuclear doctrines, capabilities and strategic threat perceptions of the P5.[5] While a retaliatory second strike continues to be at the heart of their nuclear deterrence policies, most NWS reserve the right to the first use of nuclear weapons. In addition to increasing uncertainty about the threshold for the first use of nuclear weapons, this section draws attention to a broadening range of situations in which nuclear weapons might be used, including against NNWS.

Assured retaliation

For all five NWS, the primary function of deterrence is to prevent nuclear attacks by each other. This kind of deterrence relies on 'assured retaliation', meaning the ability to survive a nuclear attack and retaliate in kind, inflicting unacceptable damage on the attacker. In addition to demonstrations of the resolve to carry out this threat if required, the credibility of the strategy essentially depends on the survivability of a state's second-strike capability, meaning that it will remain operational even after a massive first strike.

China is currently the only one of the five NWS to subscribe to a so-called no-first-use (NFU) policy. It has restricted the potential use of its nuclear weapons solely to this kind of scenario. China's 2019 defence white paper states that: 'China is always committed to a nuclear policy of no first use of nuclear weapons at any time and under any circumstances', and that the goal of its 'defensive nuclear strategy' is 'to maintain national strategic secur-

[3] On the debate on whether nuclear weapons have stabilizing effects, see e.g. Sagan, S. D. and Waltz., K. N., *The Spread of Nuclear Weapons: A Debate Renewed*, 2nd edn (W. W. Norton: New York, 2003).

[4] See e.g. Gerson, M. S., 'No first use: The next step in US nuclear policy', *International Security,* vol. 35, no. 2 (2010), pp. 7–47. For a contrasting view, see e.g. Roberts, B., 'Debating first use, again', *Survival*, vol. 61, no. 3 (2019), pp. 39–56.

[5] While not distinguishing between 'doctrinal use' and 'escalatory use', this report assumes that escalatory dynamics—even when anticipated in doctrines—are essentially not controllable. Wan, W., *Nuclear Risk Reduction: A Framework for Analysis* (United Nations Institute for Disarmament Research: New York, June 2019).

ity by deterring other countries from using or threatening to use nuclear weapons against China'.[6] Historically, China's NFU policy has been reflected in the relatively small size of its nuclear arsenal, which consists of 'barely enough weapons to credibly threaten nuclear retaliation', as well as the low state of readiness of its nuclear forces—notably based on de-mating nuclear warheads from missiles. However, this traditional posture has changed somewhat with the ongoing modernization of China's nuclear forces.[7] The most notable change is linked to China's efforts to enhance its sea-based nuclear deterrent. In order to pose a credible threat, submarines must carry operationally deployed nuclear weapons, which suggests an exception to the previous Chinese practice of de-mating.[8] However, these upgrades do not seem to suggest a shift away from its NFU policy, but rather the aim of ensuring the survivability of China's second-strike capability.[9]

The rest of the P5 claim the right to use nuclear weapons in circumstances other than nuclear second strikes. However, their doctrines also highlight the primacy of deterrence by retaliation. The 2018 US Nuclear Posture Review (NPR), for example, describes deterring 'potential adversaries from nuclear attack of any scale' as 'the highest US nuclear policy and strategy priority'.[10] The 2014 Russian military doctrine mentions nuclear attack as the primary scenario to which it might respond with nuclear weapons.[11]

Both Russia and the USA reserve the right to defend not only themselves, but also their allies. Considerations related to extended deterrence—security guarantees involving nuclear response to an enemy attack against allies—were reportedly also the main reason why the administration of US President Barack Obama ultimately rejected an NFU policy after lengthy deliberation. According to a former US official, NFU would undermine extended deterrence by 'signal[ling] clearly that the US will not be prepared to use all means available to it when their [US allies] vital interests are at risk, declining to do so unless the enemy is foolish enough to cross the nuclear red line'.[12]

The idea of preventing nuclear aggression typically underlies the more benign interpretations of deterrence, which tend to assume that the NWS are capable of the utmost caution and restraint with regard to the safety, custodial security and use of nuclear weapons. This view has been challenged by several close calls where nuclear weapons were nearly used due to miscalculation or error—often as a result of what appeared to be an imminent threat of a potential first strike.[13]

[6] People's Republic of China, State Council, *Full text: China's National Defense in the New Era*, 24 July 2019.

[7] Office of the Secretary of Defense, *Annual Report to Congress: Military and Security Developments Involving the People's Republic of China, 2019* (US Department of Defense: Washington, DC, 2 May 2019), p. 36.

[8] Zhao, T., *Tides of Change: China's Nuclear Ballistic Missile Submarines and Strategic Stability* (Carnegie Endowment for International Peace: Washington, DC, 2018).

[9] Talmadge, C., 'China and nuclear weapons', *Global China*, Sep. 2019.

[10] Office of the Secretary of Defense, *US Nuclear Posture Review*, Feb. 2018.

[11] Embassy of the Russian Federation to the United Kingdom and Northern Ireland, 'The Military Doctrine of the Russian Federation', 25 Dec. 2014, Press release, 29 June 2015.

[12] Roberts (note 4).

[13] Lewis, P. et al., *Too Close for Comfort: Cases of Near Nuclear Use and Options for Policy*, Chatham House Report (Royal Institute of International Affairs: London, Apr. 2014).

First-use scenarios

France, Russia, the United Kingdom and the USA all assert a right to the first use of nuclear weapons. There are traditionally two types of hypothetical situation in which such use is considered: the use of nuclear weapons in a conventional conflict and a preventive or pre-emptive nuclear attack aimed at eliminating a perceived nuclear threat by an adversary before it materializes.[14] While a first-use policy combined with nuclear forces designed for limited-strike missions can be seen as signalling a readiness to use nuclear weapons in a conventional conflict, the possibility of a preventive strike tends to be associated with missile defences and counterforce capabilities, meaning weapons that could be used to neutralize the adversary's nuclear arsenal. Instead of a preventive strike eliminating the adversary's nuclear capabilities, the military rationale for counterforce missions is typically articulated in terms of 'damage limitation'; that is, as an effort to reduce the catastrophic consequences of nuclear war in a case where deterrence fails.[15]

France, Russia, the United Kingdom and the USA all assert a right to the first use of nuclear weapons

Nuclear strikes in conventional conflict

The most frequently discussed first-use scenario is one in which a losing side in a regional conflict compensates for its conventional inferiority by using nuclear weapons. This can mean either retaliation in response to conventional aggression resulting from the failure of deterrence or an attempt to end a conventional conflict, or gain advantage in it, by means of a limited nuclear strike.

Such scenarios were behind the first-use policy of the USA and the North Atlantic Treaty Organization (NATO) during the cold war, when their conventional forces in Europe were overshadowed by those of the Soviet Union and the Warsaw Pact.[16] Following its previous reliance on deterrence based on 'massive nuclear retaliation', in 1967 NATO adopted a 'flexible response' strategy that was meant to be more credible and to provide means to control or end a conflict before it escalated to an all-out nuclear war. If conventional military means proved insufficient, NATO could resort to the limited use of non-strategic nuclear weapons. However, a massive nuclear strike involving US strategic nuclear forces remained 'the ultimate military response'.[17]

According to the logic of limited nuclear war based on flexible response, the consequences of an initial nuclear strike would thus be kept to the min-

[14] While the terms 'prevention' and 'pre-emption' are often used interchangeably, their meanings differ in terms of motivation. A pre-emptive attack is conducted to avoid an imminent threat, based on the perceived need 'to strike first rather than second'. A preventive attack, by contrast, seeks to eliminate a less imminent threat, based on the desire 'to fight sooner rather than later'. See Mueller, K. P. et al., *Striking First: Pre-Emptive and Preventive Attack in US National Security Policy* (Rand Corporation, Project Air Force: Santa Monica, CA, 2006).

[15] See e.g. Oelrich, I., 'The next step in arms control: Eliminate the counterforce mission', *Bulletin of the Atomic Scientists*, vol. 68, no. 1 (2012), pp. 79–85; and Purcell, R., 'A history of damage limitation in US nuclear war planning', *Global Security Review*, 23 Jan. 2020.

[16] See e.g. Heuser, B., 'The development of NATO's nuclear strategy', *Contemporary European History*, vol. 4, no. 1 (1995), pp. 37–66.

[17] The North Atlantic Treaty Organization, Final Decision on MC 14/3: Report by the Military Committee to the Defence Planning Committee on Overall Strategic Concept of the North Atlantic Treaty Organization Area, 16 Jan. 1968.

imum needed to serve the function of signalling, in which case the other side might refrain from responding in kind. Even if the other side did respond with limited strikes of its own, the assumption, or hope, was that an all-out nuclear war could still be avoided. The flexible response strategy, which accepts this uncertainty, can still be seen to underlie US nuclear policy with respect to its nuclear peers. Since the end of the cold war, however, another concept—'escalation dominance'—has gained ground in the USA with respect to potential proliferators and those states with smaller nuclear arsenals. Rather than just controlling escalation, this latter strategy aims to ensure victory at every level of escalation.[18]

As critics have warned, however, the assumptions behind escalation control might not hold in reality. Even a limited nuclear strike would be devastating in its effects and could lead to uncontrollable escalation.[19] The wisdom of escalation dominance in particular has been disputed. Superior capabilities do not necessarily deter an adversary that is prone to risk-taking, and they might lead to arms racing if an adversary seeks to match such capabilities.[20] Perhaps more disconcertingly, excessive confidence by one side in its ability to control or dominate nuclear escalation could increase risk-taking. A further risk factor is linked to the nature of limited-strike capabilities, especially nuclear weapons on dual-capable delivery systems, which could be confused with conventional forces during a crisis.[21]

Even a limited nuclear strike would be devastating in its effects and could lead to uncontrollable escalation

The post-cold war shift in the conventional balance in Europe highlighted limited nuclear strike options from a Russian perspective. Reflective of this change, Russia moved away from the Soviet-era NFU policy in 1993.[22] The idea of an escalate to de-escalate doctrine was also floated in Russian debates at the time. Proponents argued that 'the limited use of nuclear weapons early in a conflict could convince an adversary of the risks associated with continuing aggression.[23] Although this logic was eventually not incorporated into Russia's official military doctrine, mixed signals from Russia have fuelled western suspicions of a lowered Russian threshold for nuclear weapon use.[24] In addition to the political tensions following the Ukraine crisis and loose rhetoric on nuclear threats by some Russian officials in that context, these suspicions have been reinforced by the presence of nuclear-capable systems

[18] Miles, A., 'Escalation dominance in America's oldest new nuclear strategy', War on the Rocks, 12 Sep. 2018; and Fitzsimmons, M., 'The false allure of escalation dominance', War on the Rocks, 16 Nov. 2017.

[19] See e.g. Burr, W., 'Looking back: The limits of limited nuclear war', Arms Control Association, Updated 29 Aug. 2008.

[20] Fitzsimmons (note 18).

[21] See e.g. Acton, J. M. (ed.), *Entanglement: Russian and Chinese Perspectives on Non-nuclear Weapons and Nuclear Risks* (Carnegie Endowment for International Peace: Washington, DC, 2017).

[22] Federation of American Scientists, 'The basic provisions of the military doctrine of the Russian Federation', [n.d.].

[23] Nedelin, A. V., Levshin, V. I. and Sosnovsky, M. E., 'O primenenii iadernogo oruzhiya dlya deeskalastii voennikh dyestvii' [On the use of nuclear weapons for the de-escalation of military conflict], *Voyennaya Mysl*, no. 3 (May–June 1999), pp. 34–7. Cited in ven Bruusgaard, K., 'Russian strategic deterrence', *Survival*, vol. 58, no. 4 (2016).

[24] Oliker, O., 'No, Russia isn't trying to make nuclear war easier', *National Interest*, 23 May 2016; and ven Bruusgaard, K., 'The myth of Russia's lowered nuclear threshold', War on the Rocks, 22 Sep. 2017.

in some of Russia's military exercises simulating regional conflict.[25] Russia's reported development and deployment of new dual-use capabilities—notably ground-launched intermediate-range cruise missiles—as well as new nuclear systems—such as the Poseidon nuclear-powered unmanned underwater vehicle—have further contributed to western concerns.[26]

Even though Russia has consistently denied having an escalate to de-escalate doctrine, its alleged existence has contributed to a significant change in US official doctrine. In response to what it views as a prior lowering of the nuclear threshold by Russia, the 2018 NPR states that the USA: 'will enhance the flexibility and range of its tailored deterrence options', notably by including more low-yield nuclear weapons to ensure 'credible deterrence against regional aggression'.[27] More specifically, the USA plans to 'modify a small number of existing SLBM [submarine-launched ballistic missile] warheads to provide a low-yield option, and in the longer term, pursue a modern nuclear-armed sea-launched cruise missile (SLCM)'.[28] At the beginning of 2020, the US Department of Defense announced that low-yield W76-2 warheads had been deployed on Trident SLBMs by the US Navy.[29] This W76-2 deployment indicates a new way of using strategic missiles tactically.[30]

According to the NPR, the above changes raise the threshold for nuclear weapon use 'by convincing adversaries that even limited use of nuclear weapons will be more costly than they can tolerate'.[31] However, several experts argue that, on the contrary, 'developing nuclear capabilities that are suitable for lower yields or warfighting purposes' or taking 'actions that increase the credibility of "nonstrategic" nuclear weapons' represents a de facto lowering of the nuclear threshold.[32]

It should be noted that concerns related to limited nuclear war are not just associated with recently developed capabilities. Both Russia and the USA have long possessed non-strategic nuclear weapons, which were specifically designed to be used in the battlefield. Such weapons typically have lower yields and are deployed in shorter-range delivery systems than strategic nuclear weapons.[33] The combination of the lower yield and the increased

[25] The Vostok-2010 exercise reportedly included the launch of a dual-capable Tochka-U missile, whereas the Vostok-2014 conventional exercise coincided with an exercise involving strategic nuclear forces. As Oliker notes, the latter might 'have included a scenario for escalation from conventional to nuclear'. A 2013 exercise that simulated an attack on Sweden involved dual-capable bombers. See Oliker, O., 'Russia's nuclear doctrine: What we know, what we don't and what that means', Centre for Strategic and International Studies, Washington, DC, May 2016.

[26] Arms Control Association, 'The Intermediate-range nuclear forces (INF) treaty at a glance', Aug. 2019; and Kristensen, H. M. and Korda, M., 'Russian nuclear forces', *Bulletin of the Atomic Scientists*, vol. 75, no. 2 (2019), p. 76.

[27] Office of the Secretary of Defense (note 10).

[28] Office of the Secretary of Defense (note 10).

[29] US Department of Defense, 'Statement on the fielding of the W76-2 Low-Yield Submarine Launched Ballistic Missile warhead', Press release, 4 Feb. 2020.

[30] Kristensen, H. M., 'US nuclear forces', *SIPRI Yearbook 2019: Armaments, Disarmament and International Security* (Oxford University Press: Oxford, 2019), p. 298.

[31] Office of the Secretary of Defense (note 10).

[32] Mount, A. and Stowe-Thurston, A., 'What is US nuclear policy, exactly?', *Bulletin of the Atomic Scientists*, 18 Apr. 2018.

[33] Woolf, A. F., *Nonstrategic Nuclear Weapons*, Congressional Research Service (CRS), Report to Congress RL32572 (CRS: Washington, DC, 2019).

accuracy of some of the modernized non-strategic nuclear weapon types has also raised concerns about lowering the threshold for nuclear weapon use.[34]

While the relatively small nuclear arsenals of France and the UK are based on 'minimum deterrence' and characterized as strategic, both states have sought to maintain an ability to launch 'limited nuclear strikes' to avoid being 'self-deterred by an all-or-nothing concept of deterrence'.[35] In this context, France views its airborne nuclear weapons as 'essential to create space for "politico-military manoeuvre" in a critical escalatory situation'.[36] The UK's Trident SLBMs, in turn, can be adjusted to lower yields to make its 'nuclear forces a more credible deterrent against smaller nuclear threats'.[37]

Finally, the idea of nuclear first use deterring conventional war is also part of extended deterrence. Indeed, it is this component of extended deterrence that explains much of the opposition to an NFU policy in the USA and among its allies. Some observers have nonetheless questioned this logic, arguing that conventional weapons are sufficient for addressing such situations, whereas a nuclear response would be disproportionate and, if used against another NWS, could lead to a retaliatory second strike.[38]

Preventive strike

As noted above, the credibility of nuclear deterrence essentially depends on the survivability of the second-strike capability. During the cold war, both the Soviet Union and the USA worried about the possibility that the other might launch a surprise attack, thereby destroying that capability. The fear was potentially self-fulfilling as such an attack could, at least in theory, be neutralized by a similar, preventive or pre-emptive attack.[39] Technological evolution, notably the increasingly accurate ballistic missiles that improved each side's counterforce capability, as well as anti-ballistic missile (ABM) technology, which could destroy an adversary's missiles before they reached their target, fuelled mutual concerns of a disarming first strike, particularly in the 1960s.[40]

The credibility of nuclear deterrence essentially depends on the survivability of the second-strike capability

At the time, concerns about the destabilizing impact of such capabilities were highlighted by the USA, which saw them as undermining strategic stability based on assured retaliation—or what has been called 'mutually

[34] Kristensen, H. M., 'B61 LEP: Increasing NATO nuclear capability and precision low-yield strikes', *Federation of American Scientists*, 15 June 2011.

[35] Tertrais, B., 'The European dimension of nuclear deterrence: French and British policies and future scenarios', Finnish Institute for International Affairs, *Working Paper 106* (Nov. 2018).

[36] Granholm, N. and Rydqvist, J., *Nuclear Weapons in Europe: British and French Deterrence Forces* (Swedish Defence Research Agency: Stockholm, Apr. 2018); and Tertrais, B., *French Nuclear Deterrence Policy: Forces and Future* (Fondation pour la recherche stratégique: Paris, Jan. 2019).

[37] British Ministry of Defence, 'The Future of the United Kingdom's Nuclear Deterrent', London, Dec. 2006.

[38] Fetter, S. and Wolsthal, J., 'No first use and credible deterrence', *Journal for Peace and Disarmament*, vol. 1, no. 1 (2018), pp. 102–14.

[39] See Schelling, T. C., *The Reciprocal Fear of a Surprise Attack* (Rand Corporation: Santa Monica, CA, 1958).

[40] Bunn, M. and Tsipis, K., 'The uncertainties of a preemptive nuclear attack', *Scientific American*, vol. 248, no. 5 (Nov. 1983), pp. 38–47; United States Arms Control and Disarmament Agency, Arms Control and Disarmament Agreements, 'ABM Treaty', 1990, pp. 155–161; and Yost, D. S., 'Strategic stability in the cold war: Lessons for continuing challenges', *Proliferation Papers*, Institut Français des Relations Internationales (IFRI), 2011.

assured destruction'.[41] The Soviet Union, by contrast, tended to view counter-force capabilities and missile defences as a necessary means of 'damage limitation' in the event of deterrence failure, and was initially reluctant to limit such capabilities. Ultimately, however, the Soviet Union agreed to limit missile defence development jointly with the USA through the 1972 Anti-Ballistic Missile Treaty.[42]

However, following the 1983 announcement of the US Strategic Defense Initiative, which sought to develop space-based interceptors to neutralize incoming ballistic missile threats, the tables began to turn regarding Soviet and US understandings of strategic stability.[43] While US ambitions have subsequently been reduced to countering more limited missile threats, its continuing missile defence development has been an increasing source of anxiety for both China and Russia. Particularly since its withdrawal from the ABM Treaty in 2002, the USA has highlighted the need for unrestrained missile defence development and other damage limitation capabilities, arguing that terrorists and 'rogue states' seeking nuclear weapons and other weapons of mass destruction (WMD) might not be deterred in the same way as nuclear peers.[44] In addition to potential new proliferators, US damage limitation capabilities also seem to be partly directed against China. Alongside US reluctance to explicitly accept mutual vulnerability vis-à-vis China, this reflects an assumption that by signalling that the USA has a higher tolerance for bearing the risks of nuclear escalation, such capabilities could deter China from starting a conflict.[45]

Both Russia and China worry that what the USA views as damage limitation capabilities could ultimately undermine the credibility of their respective nuclear deterrents, thereby potentially enabling a disarming strike by the USA. The underlying threat scenario no longer involves just nuclear weapons and missile defences, but also includes advanced long-range conventional weapons and cyber capabilities. As the Russian President Vladimir Putin, argued in 2017, 'some high-precision weapons are used to carry out a pre-emptive strike, while others serve as a shield against a retaliatory strike, and still others carry out nuclear strikes'.[46] Based on a similar threat perception, China has called for an immediate end to the development or deployment of global missile defence systems, stressing the need to prevent 'the high-tech arms race from aggravating the international strategic imbalance'.[47]

[41] See e.g. Scoblic, J. P., '*Robert McNamara's logical legacy*', Arms Control Association, [n.d.].

[42] Yost (note 40).

[43] Atomic Archive, President Reagan's SDI Speech, '*Address to the nation on defense and national security*', 23 Mar. 1983; and Eisendrath, C., Goodman, M. A. and March, G. E., *The Phantom Defense: America's Pursuit of the Star Wars Illusion* (Praeger Publishers: Westport, 2001).

See e.g. Putin, V., '*Presidential address to the Federal Assembly*', Official website of Russian president, 1 Mar. 2018.

[44] Office of the Federal Register, National Archives and Records Administration, Public papers of the Presidents of the United States: George W. Bush 2001, Book II: July to December 2001, 'Remarks announcing the United States Withdrawal from the Anti-Ballistic Missile Treaty', 13 Dec. 2001, pp. 1510–11; and McDonough, D. S., *Nuclear Superiority: The 'New Triad' and the Evolution of Nuclear Strategy*, Adelphi Paper 383 (International Institute for Strategic Studies: London, 2006), pp. 74–76.

[45] Talmadge (note 9).

[46] See e.g. Putin, V., 'Meeting with heads of international news agencies', Official website of the Russian president, 17 June 2016.

[47] Second Session of the Preparatory Committee for the 2020 NPT Review Conference, Chinese working paper, 19 Apr. 2018; and Zhao, T., 'China wants more nuclear-armed submarines: should

The perceived need to secure a second-strike capability seems to be a major driver of the recent nuclear modernization and strategic weapon development programmes of both China and Russia.[48] This rationale is repeatedly mentioned by the Russian leadership. For example, in March 2018 President Putin explained that Russia's new strategic nuclear weapons—including the Avangard hypersonic glide vehicle—had been developed 'in response to the unilateral withdrawal of the United States of America from the Anti-Ballistic Missile Treaty and the practical deployment of their missile defence systems both in the US and beyond their national borders'.[49] China, for its part, has sought to ensure its second-strike capability by developing multiple independently targetable re-entry vehicles (MIRVs), road-mobile missile launchers, SLBMs and hypersonic weapons.[50]

Like cold war threat scenarios of a surprise attack, Chinese and Russian perceptions today tend to downplay the uncertainties and risks faced by the perpetrator of a potentially disarming first strike.[51] China and Russia have also not been reassured by US assurances that its missile defences are directed solely against 'rogue' states. Their mistrust can partly be explained by the ambiguities in US strategy. For example, while the *2019 US Missile Defense Review* notes that US strategic defences are directed against 'existing and potential rogue state offensive missile capabilities', it also states that 'in the event of conflict' the system 'would defend, to the extent feasible, against a ballistic missile attack upon the US homeland from any source'.[52]

Moreover, the USA has reportedly prepared military options for—and its officials have openly discussed the possibility of—a preventive strike against a nuclear-armed North Korea, including cyberattacks that could disable North Korean missiles before they are launched.[53] This, as well as some wording in the 2018 NPR related to the US ability to degrade North Korean missile capabilities prior to launch, has made the previously highly hypothetical scenario of a preventive strike appear more realistic.[54] Nonetheless, a disarming first strike remains unlikely due to the enormous risks involved for the attacker—even in the case of North Korea, which has a relatively small nuclear arsenal.[55]

everyone be worried?', Carnegie-Tsinghua Center for Global Policy, 22 Oct. 2018.

[48] See e.g. Putin, V., 'Presidential address to the Federal Assembly', Official website of the Russian president, 1 Mar. 2018; and Kile, S. N. and Kristensen, H. M., 'Chinese nuclear forces', *SIPRI Yearbook 2019: Armaments, Disarmament and International Security* (Oxford University Press: Oxford, 2019), p. 318.

[49] Putin (note 43).

[50] Center for Strategic and International Studies, 'China's nuclear strategy and capabilities: A conversation with Hans Kristensen', Podcast, 2 July 2019; Zhao (note 47); and Saalman, L., 'China's calculus on hypersonic glide', SIPRI Topical Backgounder, 15 Aug. 2017.

[51] A key source of uncertainty is linked to the effectiveness of missile defences at intercepting incoming missiles. See e.g. Grego, L., Lewis, G. N. and Wright, D., *Shielded from Oversight: The Disastrous US Approach to Strategic Missile Defense* (Union of Concerned Scientists, July 2016).

[52] Office of the Secretary of Defense, *2019 Missile Defense Review*, [n.d.].

[53] Sanger, D. E., 'Talk of "preventive war" rises in White House over North Korea', *New York Times*, 20 Aug. 2017.

[54] According to the US Nuclear Posture Review, 'US and allied missile defenses are increasingly capable against North Korea's missile threat, and the United States has the early warning systems and strike capabilities necessary to degrade North Korean missile capabilities prior to launch'. Office of the Secretary of Defense (note 10).

[55] Majumdar, D., 'There are several military options to attack North Korea: All of them bad', War is Boring, 11 Aug. 2017.

Nuclear response to other non-conventional threats and cyberattacks

Since the early 2000s, several NWS have expanded the scope of their nuclear deterrence policies to counter threats involving all weapons of mass destruction, including against NNWS suspected of nuclear proliferation. The extent to which this form of deterrence applies to all states regardless of their nuclear status is not always clear. For example, the Russian doctrine reserves 'the right to use nuclear weapons in response to use of nuclear and other weapons of mass destruction', without explaining whether this includes such use by the NNWS.[56]

However, in many cases deterrence against WMD-related threats is explicitly said to constitute an exception to Negative Security Assurances (NSAs) whereby NWS generally commit to refrain from the use or threat of use of nuclear weapons against NNWS.[57] All five of the NWS have issued NSAs either in the form of unilateral pledges or, in some cases, as legally binding commitments as part of the relevant protocols to the various regional treaties establishing nuclear weapon-free zones. However, with the exception of China, which has stated that it would not threaten NNWS with nuclear weapons 'under any circumstances', such assurances are typically accompanied by reservations.[58]

The French doctrine defines the broadest range of situations in which nuclear deterrence could be aimed at NNWS

The French doctrine defines the broadest range of situations in which nuclear deterrence could be aimed at NNWS. France claims the right to use nuclear weapons against any NNWS that is non-compliant not only with the NPT, but also with its obligations under the 1993 Chemical Weapons Convention or the 1972 Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological and Toxin Weapons and on their Destruction.[59]

The USA and the UK, in turn, deny NSAs to states that are either not party to the NPT or have been found to be in non-compliance with their obligations under that treaty.[60] At the same time, the USA reserves the option to use nuclear weapons in response to biological or chemical attacks and cyberattacks without specifying whether this further limits the scope of its NSAs.[61]

Making exceptions to NSAs based on treaty non-compliance could be regarded as particularly problematic in the light of the politicization of past compliance disputes and the weakening of the sovereignty norm in such

[56] Embassy of the Russian Federation to the United Kingdom and Northern Ireland (note 11).

[57] That most nuclear-armed states are parties to the relevant international conventions on chemical and biological weapons might suggest that this form of nuclear deterrence is primarily aimed at NNWS. Of the nine nuclear-armed states, only Israel and North Korea have not ratified the Chemical Weapons Convention, whereas Israel is the only one not to have signed the Biological and Toxin Weapons Convention.

[58] See Ingram, P., 'Renewing interest in negative security assurances', *BASIC Briefing Paper* (June 2017).

[59] Ingram, P., *Negative Security Assurances: The Test of Commitment to Multilateral Nuclear Disarmament?* (British American Security Information Council, BASIC: London, May 2018).

[60] Office of the Secretary of Defense (note 10); and UK Government, *National Security Strategy and Strategic Defence and Security Review 2015: A Secure and Prosperous United Kingdom* (Prime Minister's Office: London, 2015). Both states also reserve the right to adjust their NSAs depending on the future evolution of non-conventional threats. See also Office of the Secretary of Defense (note 10).

[61] Office of the Secretary of Defense (note 10).

cases—the 2003 invasion of Iraq being a case in point.[62] Instead of their stated purpose of dissuading potential proliferators, both conventional and nuclear threats might paradoxically convince states of the need for an effective deterrent of their own. The North Korean decision to pursue nuclear weapons may be a case in point.[63] The policy of applying nuclear deterrence to counter chemical, biological and cyber threats also raises questions about attribution—further adding to concerns that nuclear weapons could be used against NNWS in an arbitrary and disproportionate manner.[64]

III. Addressing concerns about a lowered threshold for nuclear weapon use

Nuclear doctrines define the 'appropriate' conditions for crossing the threshold for the use of nuclear weapons. Determinations of whether such conditions have been met ultimately depend on the subjective assessments of the leaders of nuclear-armed states, and nuclear doctrines constitute the terms of reference for their assessments.[65] Based on the above analysis of scenarios in which the threshold for nuclear weapon use might be crossed, this section highlights what are arguably the most problematic aspects of the current nuclear policies of the five NWS. Having made the case for greater nuclear restraint, the section proposes a number of measures that could be taken to alleviate concerns about a lowering of the threshold for nuclear weapon use. These involve *raising awareness* of the risks involved even in the limited use of nuclear weapons; *declaratory policies* and *transparency measures*, through which the nuclear-armed states would be able to signal restraint; *strategic stability dialogue* to address the underlying issues that have contributed to the increasing salience of nuclear weapons in current doctrines and postures; and verifiable *arms control and other concrete measures*, by which nuclear-armed states could prove their seriousness about moving towards a more responsible nuclear weapon policy.

The need for greater nuclear restraint

As highlighted above, concerns about nuclear first strikes have resurfaced in recent years as a result of technological evolution, political tensions and doctrinal ambiguities. Such concerns are linked first to the actual or perceived readiness of states—typically those which view themselves as possessing inferior conventional forces—to launch nuclear strikes as part of a conventional conflict. Another focus of first-use concerns is the possibility of a disarming strike by states that are perceived by others to be in possession of, or about to develop, superior strategic systems that could undermine the adversary's second-strike capability. In contrast to the past, the military options associated with the latter threat scenario are no longer limited to

[62] Ingram (note 59).

[63] See e.g. Bermudez, J. S., 'North Korea's development of a nuclear weapon strategy', North Korea's Nuclear Futures Series, US–Korea Institute at SAIS, 2015.

[64] Blair, B. and Wolfsthal, J., 'We still can't "win" a nuclear war: Pretending we could is a dangerous fantasy', *Washington Post*, 1 Aug. 2019.

[65] Wan (note 5).

nuclear weapons and missile defences, but also include new technologies such as advanced conventional weapons and cyberwarfare capabilities.[66]

In so far as perceptions of a lowered threshold for nuclear weapon first use are supported by actual doctrines and capabilities, it can be said to increase the risk of nuclear war. Several observers have made this argument about the US 2018 NPR, which expands the situations in which US nuclear weapons might be used and introduces new low-yield capabilities with an apparent war-fighting role. However, even when assumptions about a lowered nuclear threshold by a given state are made on a more hypothetical basis, this tends to create instability and to highlight the role of nuclear weapons in other states' military doctrines. Such dynamics can be seen in connection to both western reaction to Russia's alleged escalate to de-escalate doctrine, and the threat of a US preventive first strike as perceived by China and Russia. In each case, the other side's assumed propensity for nuclear aggression has been reinforced by mixed messages and ambiguity, fuelling new armament dynamics. Using classical terminology, strategic stability has thus been undermined not only by increased 'crisis instability', but also by 'arms race instability'.[67]

The current uncertainty about the lowering of the nuclear threshold is also linked to the longer-term trend for several NWS to broaden the purpose of nuclear deterrence in a manner that highlights the possibility of nuclear weapon use against NNWS. However, nuclear threats hardly represent an optimal solution to non-proliferation crises. In addition to raising legal and ethical questions related to the proportionality of the use of military force, such threats could have the paradoxical effect of convincing a potential proliferator of the need for a nuclear deterrent.[68]

All of these developments highlight the urgent need for NWS to exercise more restraint in order to reduce the risk of nuclear war and to prevent new and destabilizing armament competition and proliferation dynamics. The remainder of this section makes practical recommendations on more responsible nuclear weapon policy focused on reducing doctrinal ambiguity and more credible signalling by the NWS that their thresholds for nuclear weapon use remain high.

Recommendation 1: Raise awareness of nuclear risks

As noted above, nuclear doctrines provide guidance for the leaders of the NWS, who would be the ones making the final decision on the use of nuclear

[66] See e.g. Lieber, K. A. and Press, D. G., 'The new era of counterforce: Technological change and the future of nuclear deterrence', *International Security*, vol. 41, no. 4 (Spring 2017), pp. 9–49; and Futter, A., 'The dangers of using cyberattacks to counter nuclear threats', Arms Control Association, July/Aug. 2016.

[67] Strategic stability has been defined as consisting of crisis stability and arms race stability. *Crisis stability* is defined as a situation in which leaders are not incentivized 'to strike first, in particular with nuclear weapons, to avoid suffering the consequences of an enemy's first move'. *Arms race stability* refers to 'the absence of perceived or actual incentives to augment a nuclear force—qualitatively or quantitatively—out of the fear that in a crisis an opponent would gain a meaningful advantage by using nuclear weapons first'. See Brustlein, C., 'The erosion of strategic stability', *IFRI Proliferation Papers*, no. 60 (Nov. 2018); and Acton, J. M., 'Reclaiming strategic stability', eds E. A. Colby and M. S. Gerson, *Strategic Stability: Contending Interpretations* (US Army War College Press: Carlisle Barracks, PA, Feb 2013), pp. 117–45.

[68] Ingram (note 58).

weapons. Their capacity for restraint could be undermined by the notorious difficulty of grasping the enormity of the related risks and ethical dilemmas. Based on careful consideration, such risks far outweigh the threats that nuclear deterrence is designed to counter. The humanitarian movement and the Treaty on the Prohibition of Nuclear Weapons (TPNW) have helped to highlight such risks and the relevant legal, moral and ethical issues. However, the current debate is marked by a disconnect between the humanitarian and the military security discourses. To further promote discussion on the risks of deterrence, new research is needed on the contemporary notion of limited nuclear war and the potential use of low-yield nuclear weapons.

While some studies have recently been conducted on the consequences of nuclear weapon use in the South Asian context, the results were mostly discussed within the humanitarian movement, with seemingly little impact on more deterrence-minded audiences—including those in India and Pakistan.[69] Such work should be expanded to include specific scenarios for nuclear escalation in Europe and North East Asia, factoring in the military doctrines of the relevant states. This would be in line with the suggestion in a recent Carnegie Endowment working paper, which calls for new studies exploring scenarios for nuclear weapon use based on the information known about existing nuclear arsenals and doctrines. With the aim of reducing the risks posed by current nuclear arsenals and deterrence policies, the report recommends using computational modelling to take account of the different numbers, yields and targets of nuclear weapons, as well as the environments affected by the fallout and the climatic effects of nuclear detonation.[70]

The current debate is marked by a disconnect between the humanitarian and the military security discourses

The results of such studies should be made accessible to the general public, particularly in the NWS, the umbrella states and the states most affected by potential nuclear weapon use. The results could also be debated in international forums involving both NWS and NNWS. The emerging international consensus on the need for nuclear risk reduction provides opportunities for conducting such a debate. For example, the topic could be explored in a series of international conferences focused on reducing the risk of nuclear weapon use, which could be organized during the five-year review period preceding the 2025 NPT Review Conference.[71] If held outside of the NPT framework, the conferences would also allow the inclusion in the discussion of non-states parties to the NPT.

Over time, increased awareness of the risks of current deterrence policies might lead NWS and their allies to reduce reliance on nuclear weapons, or to adjust their doctrines and postures in a way that is more conducive to strategic stability. Such awareness could also help prevent miscalculation by the leaders of the NWS when faced with crisis situations. Moreover, risk awareness might ultimately increase their readiness for nuclear disarmament, which might be the most effective risk-reduction measure. However, while the debate on disarmament remains polarized, the NWS are

[69] Perkovich, G., *Toward Accountable Nuclear Deterrents: How Much is Too Much?* (Carnegie Endowment for International Peace: Washington, DC, Feb. 2020).

[70] Perkovich (note 69).

[71] This idea was raised at an expert meeting, 'Unlocking nuclear disarmament diplomacy', held at SIPRI on 2 Sep. 2020.

more likely to be drawn into such a dialogue if it is framed in terms of risk-reduction rather than disarmament.

Recommendation 2: Provide reassurance through declaratory policy

There is significant ambiguity in current doctrines and declaratory policies regarding the circumstances in which nuclear weapons might be used. This raises doubts about the capability of NWS to manage nuclear risks and exercise the kind of restraint needed to preserve international security and maintain the global nuclear disarmament and non-proliferation regime. To build confidence in their ability to exercise responsible nuclear restraint, the NWS should adjust their declaratory policies to alleviate concerns about nuclear attacks against each other and the NNWS.

Denouncing nuclear weapons as means of war

Several NNWS and civil society actors, as well as UN Secretary-General António Guterres, have urged the NWS to endorse a statement along the lines of the one issued by the former US President, Ronald Reagan, and the last president of the Soviet Union, Michael Gorbachev, in 1987 that 'nuclear war cannot be won and must never be fought'.[72] Such a public acknowledgement of the devastating consequences for all sides of any use of nuclear weapons is regarded as a much-needed demonstration of restraint at a time when the threshold for nuclear weapon use seems to be lowering.

While China and Russia have signalled support for such a statement, France, the UK and the USA have opposed it, suggesting that it would be inconsistent with their nuclear doctrines.[73] Their opposition reflects the concern that demonstrating restraint in this way might affect the credibility of deterrence. However, a denouncement of nuclear war would not exclude the possibility of a retaliatory strike in a situation where such a war had already been initiated by the other side. Inasmuch as it is this concern that lies behind objections to renewing the Reagan–Gorbachev statement, the declaration could be reformulated to make this point more explicit.

Moreover, while a joint statement by the NWS denouncing nuclear war could pave the way for the adoption of an NFU policy (see below), it would not need to be incompatible with current first-use doctrines. Rather, it could help to reduce threat perceptions related to such doctrines by adding emphasis to existing assurances that first use would only be contemplated in extreme circumstances where the existence of a nuclear-armed state or its ally is at stake.

Even if most NWS continue to have reservations about endorsing an updated version of the Reagan–Gorbachev declaration, China and Russia could issue their own formal statement on the issue. India, which claims to have an NFU policy and might thus be expected to have fewer reservations

[72] Ronald Reagan Presidential Library and Museum, 'Joint Statement on the Soviet–United States Summit Meeting, 10 Dec. 1987'; and United Nations Office for Disarmament Affairs, *Securing Our Common Future: An Agenda for Disarmament* (United Nations: New York, 2018).

[73] Brown, J. and Potter, W., 'Open forum: Time for a reality check on nuclear diplomacy', *San Francisco Chronicle*, 24 Apr. 2019; and O'Connor, T., 'Russia keeps asking US to agree to no nuclear weapons use, but it's not getting any answer', *Newsweek*, 6 Nov. 2019.

about the issue, could also be invited to be part of such a joint statement.[74] The statement should be widely acknowledged and supported by NNWS within the framework of the NPT and the UN General Assembly. Depending on the positions of the five NWS, the statement denouncing nuclear war could eventually be endorsed as part of the P5 process and in the form of Security Council resolutions.[75]

Adopting a no-first-use policy

As noted above, the logic of nuclear first use relies on hypothetical assumptions that might not hold in real life: a nuclear strike by one side might provoke rather than deter further escalation by the other, and a preventive attack could lead to nuclear retaliation despite the attacker's confidence in its defensive systems. The mere perception of readiness for nuclear first use by one side can undermine strategic stability by leading to new armament competition, and by increasing the likelihood of nuclear war based on miscalculation.

On the basis that such risks outweigh any perceived benefits of nuclear first use, several experts have called for other NWS to follow the example of China by adopting an NFU doctrine.[76] If all the nuclear-armed states were to restrict the potential use of nuclear weapons to retaliatory second strikes—and adopt sole purpose declarations (see below)—this would, in principle, rule out the possibility of intentional nuclear war.

While it would be advisable for all nuclear-armed states to adopt an NFU policy, some might still view the relative weakness of their conventional forces as a reason to retain their first-use policies. Hence the most likely candidates for abandoning such doctrines would be those nuclear-armed states with the strongest conventional forces.[77] From this perspective, nuclear risk reduction could be said to benefit from a balance of conventional forces—with the caveat such a balance does not necessarily equal conventional stability.[78] Combined with sufficient military capabilities, an NFU policy could have the additional benefit of boosting the psychological effect of conventional deterrence, as it would signal confidence in such capabilities.

As with the above proposal for denouncing nuclear war, China and India could lead the way in promoting NFU, possibly by strengthening their existing policy by means of a joint statement. Any new declarations on NFU policies should be encouraged by expressions of NNWS and civil society support within the NPT review process and the UN General Assembly. Those NNWS with extended deterrence arrangements should also critically examine the argument that NFU jeopardizes their security by factoring

[74] Government of India, 'The Cabinet Committee on Security reviews operationalization of India's nuclear doctrine', Ministry of External Affairs, Press release, 4 Jan 2003.

[75] Thakur, R., 'The P5 must reaffirm that nuclear war can't be won and mustn't be fought', Australian Strategic Policy Institute (ASPI), 15 Oct. 2019. The P5 process refers to meetings among the P5 to discuss progress towards meeting their disarmament commitments under the NPT.

[76] Blair and Wolfsthal (note 64).

[77] Blair and Wolfsthal (note 64).

[78] Unlike nuclear deterrence, the concept of conventional deterrence is highly 'contested', meaning that one's capacity to carry out the threat is subject to doubt. Even though one side might be superior in terms of the quality or number of military capabilities, the other's tactics, strategy, command structures and morale might provide it with significant leverage. See Wirtz, J. J., 'How does nuclear deterrence differ from conventional deterrence?', *Strategic Studies Quarterly* (Winter 2018), pp. 58–75; and Brustlein (note 67).

in conventional deterrence and the risks of nuclear weapon use, possibly drawing on the findings of the new studies recommended above.

Adopting a sole purpose declaration

The NWS could further reduce the role of nuclear weapons by adopting a 'sole-purpose' declaration. In a partial overlap with both NSA and NFU, this would restrict the role of nuclear weapons to deterring a nuclear attack. By ruling out the application of nuclear deterrence to conventional, chemical or biological weapon use or cyberattacks, a sole-purpose doctrine would reduce existing uncertainties around first strikes among nuclear-armed states and potential nuclear attacks against NNWS.

Strengthening Negative Security Assurances

Current nuclear doctrines create considerable uncertainty as to whether or under what circumstances NNWS might end up as targets of nuclear attacks. This uncertainty is highlighted by the reservations and exceptions to existing NSAs. In particular, the credibility of the NSAs is undermined by the right professed by some NWS to use nuclear weapons to counter threats related to any type of WMD, including against states which are non-compliant with or not party to relevant treaties.

On the basis of the above discussion, which questions the benefits of the threat of nuclear weapon use against NNWS, this report joins long-standing calls by several NNWS and civil society in recommending that all the conditions and reservations attached to existing NSAs should be dropped. This could begin with the adjustment of unilateral pledges, whereby NWS would provide unconditional assurances that they will never target NNWS with nuclear weapons. In addition to the five NWS that are parties to the NPT, unconditional NSAs should also be issued by the nuclear-armed states that are outside of the NPT. Despite its policy of neither confirming nor denying its possession of nuclear weapons, Israel too could join in a more general international statement endorsing unconditional NSAs—possibly in the context of efforts to establish a WMD-free zone in the Middle East.[79]

Current nuclear doctrines create considerable uncertainty as to whether or under what circumstances NNWS might end up as targets of nuclear attacks

Such pledges could pave the way for the ratification of nuclear weapon-free zone protocols involving NSAs by states that have not yet done so, and ultimately for an international treaty providing universal, unconditional and legally binding NSAs to all NNWS.

Recommendation 3: Reduce uncertainty though transparency and doctrinal dialogue

One way for the NWS to demonstrate restraint regarding their nuclear weapon policies would be through transparency in their capabilities and doctrines. Transparency can contribute to strategic stability by alleviating the tendency to overestimate the adversary's capabilities and its readiness to use nuclear weapons first.

[79] Ingram (note 58).

Until recently, arms control agreements have ensured a relatively high level of transparency about Russian and US capabilities. Although the 1987 Intermediate-Range Nuclear Forces (INF) treaty collapsed in 2019, the 2010 New Strategic Arms Reduction Treaty (New START) remains in place. If New START is not extended beyond its expiry in February 2021, however, the USA and Russia will lose the transparency provided by its verification regime. While it would not constitute progress, a New START extension would be a straightforward step towards preventing further loss of transparency and keeping misperceptions in check about the two states' respective nuclear force postures and capabilities.

There is also an urgent need for greater transparency about current nuclear doctrines in order to clarify uncertainties, ambiguities and potential misperceptions. The most effective way to do this would be frank dialogue involving all the NWS. Currently, some political momentum exists for such dialogue within the P5 process. In this context, the P5 side-event on nuclear doctrines, which was planned to be held at the 2020 NPT Review Conference—now postponed to 2021 due to the coronavirus disease 2019 (COVID-19) crisis—could be used as a basis for more sustained and substantive doctrinal dialogue.[80] The decision to hold the event reflected an agreement among the five NWS on the need 'to have an objective assessment of each other's strategic intentions, enhance dialogue on nuclear policies and doctrines, promote strategic trust and common security, and make utmost efforts to prevent nuclear risks, in particular resulting from miscalculation and misperception'.[81] The most urgent task for such efforts would be to clarify the ambiguities about the US and Russian thresholds for first use of nuclear weapons in a regional war.

There is also an urgent need for greater transparency about current nuclear doctrines in order to clarify uncertainties, ambiguities and potential misperceptions

In addition, the US initiative on Creating the Environment for Nuclear Disarmament (CEND) is reportedly exploring how to improve transparency in nuclear doctrines, whereas the ministers in the so-called Stockholm Initiative have pledged to promote a deepening of the discussion on nuclear doctrines both among the NWS and with NNWS throughout the next NPT review period.[82]

Doctrinal dialogue could also be taken forward in the context of the above proposal for risk reduction conferences. Some of the sessions of such conferences could, for example, be dedicated to a discussion of the risks of current US and Russian doctrines based on the concept of a limited nuclear war involving low-yield nuclear weapons. As suggested above, risk reduction conferences would also allow the inclusion in the dialogue of non-states parties to the NPT. In addition to the threshold for first use, the discussion should touch on other aspects of declaratory policy, such as NSAs. The NNWS should be involved in the discussion on NSAs in particular.

[80] Third Session of the Preparatory Committee for the 2020 NPT Review Conference (note 2).
[81] Third Session of the Preparatory Committee for the 2020 NPT Review Conference (note 2).
[82] US Department of State, 'Lessons from disarmament history for the CEND initiative', Remarks by C. A. Ford, 30 Apr. 2019.

Recommendation 4: Address underlying threat perceptions through strategic stability dialogue

Ultimately, the nuclear-armed states should seek to address the long-standing issues that have led to a greater reliance on nuclear weapons in their strategies and doctrines. Such issues seem to be mainly related to their threat perceptions regarding each other's offensive and defensive strategic capabilities, and to their apparent readiness to assign war-fighting roles to nuclear weapons.

Russia and the USA have already been engaged in so-called strategic stability talks, but there has been no indication that any progress has resulted from such consultations—possibly because the two sides do not even seem to agree on the meaning of strategic stability.[83] However, fundamental disagreements should not be viewed as an obstacle to addressing the 'irritants' in relations between the major NWS, as the US–Russian dialogue initially claimed to do.[84] Instead of an agreement, the immediate goal of such a dialogue should be to highlight key areas of disagreement in order to provide a better understanding of the most contentious issues and the other side's threat perceptions. Together with greater transparency about nuclear doctrines, this could help to avoid the most dangerous overreactions by the major NWS to each other's nuclear policies and strategic postures.

The bilateral US–Russian dialogue format should therefore be reinvigorated. It should also be expanded to include other NWS—notably China, as US threat perceptions increasingly highlight its evolving nuclear policy.[85] China cannot realistically be expected to join any nuclear arms control process in the near future due to the disparity between its arsenal and those of Russia and the USA. Nonetheless, China would have an interest in a dialogue on strategic issues relevant to its respective threat perceptions, particularly those related to US missile defence deployments. In addition to the balance between offensive and defensive strategic capabilities, the agenda for such a dialogue could include non-strategic and strategic nuclear weapons, advanced conventional weapons, the militarization of space and cybersecurity.

Given the complexity of the issues surrounding nuclear deterrence, the consultations could be arranged in a format similar to that of the 2009 Russian–US Bilateral Presidential Commission. This comprised several parallel working groups, each of which dealt with a particular topic. While the consultations would be limited to the NWS, they should nonetheless report back to NNWS to allow a better-informed discussion on the strategic challenges facing nuclear arms control and disarmament.[86]

The ultimate objective should be to reduce the role of nuclear weapons and to address the drivers of strategic armament competition in the Russian, US and Chinese military strategies. This could be done though confidence-

[83] The US–Russian talks, which are now known as the 'strategic *security* dialogue', have been held at deputy foreign minister level since July 2017. The most recent meeting was in Jan. 2020. Reif, K. and Bugos, S., 'US–Russia talks to begin soon, US says', *Arms Control Today*, Mar. 2020.

[84] Tass, 'Russia and US beginning strategic stability dialogue, diplomat', 20 July 2017.

[85] In addition to trilateral arms control talks with China and Russia, in Dec. 2019 the USA proposed a bilateral strategic security dialogue with China. Reif and Bugos (note 83).

[86] Preparatory Committee for the 2020 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, Third Session, 'Statement by the United States', 2 May 2019.

building and voluntary measures in the trilateral context, as well as arms control and disarmament measures by Russia and the USA.

Recommendation 5: Validate nuclear restraint through arms control and voluntary practical measures

A new US–Russian arms control agreement would institutionalize restraint between the two largest nuclear weapon possessors through verifiable limits on their arsenals. Several measures have already been put forward that could be considered part of a new arms control process. For example, one way to alleviate concerns about a reduced threshold for nuclear weapon use in a regional conflict in Europe would be through an agreement in which both Russian and US non-strategic nuclear warheads were verifiably de-mated from delivery systems, notably from cruise missiles.[87] This could pave the way for new, verifiable nuclear weapon reductions and limits on those non-nuclear systems that significantly influence nuclear deterrence and strategic stability. As suggested above in connection with the proposed strategic stability dialogue, the new arms control agenda is likely to be much broader than the traditional model focused solely on nuclear capabilities.

In addition to reducing nuclear risks and stabilizing deterrence relationships, arms control would constitute important progress towards the ultimate elimination of nuclear weapons. The current perception of several NNWS is that the NWS are not meeting their NPT-based disarmament commitments. This perception could ultimately undermine the NPT's non-proliferation pillar. A return to arms control negotiations by Russia and the USA would demonstrate their seriousness about living up to their responsibilities as the largest NWS, thereby restoring some of the lost legitimacy of the NPT.

However, there are also several practical measures short of arms control that could be taken by the NWS to demonstrate restraint and to reduce nuclear risks. These include reducing the operational readiness of nuclear weapons and establishing joint early warning centres and hotlines for crisis communication.[88]

IV. Conclusions

Nuclear deterrence is by nature fragile and risky, largely due to the possibility of the first use of nuclear weapons. That is not to say that deterrence based on assured retaliation is safe or unproblematic. In addition to the possibility of error and accident, a second nuclear strike—as critics note—'would not undo the destruction already suffered' and 'might even provoke additional nuclear strikes'.[89] However, while potentially raising the bar for conventional aggression, first-use doctrines and the related threat perceptions are

[87] Podvig, P., Snyder, R. and Wan, W., *Evidence of Absence: Verifying the Removal of Nuclear Weapons* (United Nations Institute for Disarmament Research: Geneva, 2018).

[88] See e.g. Wan (note 5).

[89] Preparatory Committee for the 2020 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, Second Session, 'Nuclear weapons and security: A humanitarian perspective', Working paper by Austria, 12 Mar. 2018, NPT/CONF.2020/PC.II/WP.10.

prone to undermine the strategic stability that is so essential for managing nuclear risks.

By focusing on potential scenarios for nuclear weapon use based on current doctrines, this report has made the case for greater nuclear restraint. In particular, it has called on the NWS to reduce ambiguity about their respective thresholds for use, to move away from first-use policies and to strengthen existing NSAs.

While much of the responsibility here necessarily falls on the NWS, some of the proposed measures could be initiated without their direct contribution. For example, nuclear risk reduction conferences could be organized by NNWS and research institutes could conduct new studies on the effects of limited nuclear strikes. Moreover, the proposed steps towards more responsible declaratory policies could be driven by those NWS that already either subscribe to such policies or have expressed an openness to consider them. Together with broad support from the NNWS and civil society, this could add credibility to existing demonstrations of restraint and push other nuclear-armed states to follow suit.

Progress will depend on the readiness of the NWS to address the issues that have contributed to a reliance on nuclear weapons in their military doctrines

Ultimately, however, progress will depend on the readiness of the NWS to begin to address the issues that have contributed to greater reliance on nuclear weapons in their military doctrines. If the planned P5 discussion on nuclear doctrines can continue beyond the 2021 NPT Review Conference, it could be used to enhance transparency, clear up doctrinal ambiguities and explore adjustments to declaratory policies. At the same time, this report highlights the need for a more in-depth dialogue to address the underlying strategic disagreements and threat perceptions among the major NWS. In addition to helping to create strategic empathy among them, such a dialogue could prepare the ground for much-needed verifiable nuclear restraint in the form of arms control and disarmament measures and agreements.

Abbreviations

ABM	Anti-ballistic missile
CEND	Creating the Environment for Nuclear Disarmament
COVID-19	Coronavirus disease 2019
INF	Intermediate-Range Nuclear Forces
MIRV	Multiple independently targetable re-entry vehicle
NATO	North Atlantic Treaty Organization
New START	2010 New Strategic Arms Reduction Treaty
NFU	No-first-use
NNWS	Non-nuclear weapon states
NPR	2018 US Nuclear Posture Review
NPT	1968 Treaty on the Non-Proliferation of Nuclear Weapons (Non-Proliferation Treaty, NPT)
NSAs	Negative Security Assurances
P5	Five permanent members of the United Nations Security Council
SLBMs	Submarine-launched ballistic missile
SLCM	Sea-launched cruise missile
TPNW	Treaty on the Prohibition of Nuclear Weapons
WMD	Weapons of mass destruction

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