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Sethi, Manpreet, "Global Nuclear Developments 2017-2020: Implications for India's Nuclear Policy" National Security, Vivekananda International Foundation Vol.III (2) (2020) pp.232-245.

<https://www.vifindia.org/sites/default/files/national-security-vol-3-issue-2-article-MSethi.pdf>

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Article

Global Nuclear Developments 2017-2020: Implications for India's Nuclear Policy

Manpreet Sethi

Abstract

The last half of 2010's saw nuclear weapons gaining traction in security strategies. New technologies have blurred the line between nuclear and conventional weapons. While the Ban treaty convention saw overwhelming support, global nuclear arms control seems to be at the cusp of falling after the United States of America decided to pull out of the Intermediate-Range Nuclear Forces Treaty. The article explores India's nuclear policy in light of these events and the technological leaps and its implications which might have a significant impact on future decision making regarding India's nuclear policy.

2017 will be remembered by nuclear watchers as the year that set into motion a new phase on thinking about nuclear weapons. Ironically, despite the conclusion of the Treaty on Prohibition of Nuclear Weapons (TPNW or Ban treaty) in July 2017, which received an overwhelming support from the non-nuclear weapon states (NNWS) but which was not joined by any of the nuclear armed states, several other developments brought the salience of nuclear weapons into prominence. Unlike the period 2008-2014 when many influential political figuresⁱ were talking about the possibility of nuclear disarmament, the

ⁱ For instance, the three editorials of the four horsemen that appeared in Wall Street Journal editions of January 2007, 2008 and 2009 or the Prague speech of then US President, Barack Obama, were all hinting at the eventual elimination of nuclear weapons.

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period 2017-2020 has seen a sharp turn-around. In fact, 2017-18 was dotted with rather casual references to the use of nuclear weapons, particularly by Presidents Trump and Kim Jong-un. Their Summit meetings subsequently brought down the nuclear temperature, but achieved no breakthrough on denuclearisation of DPRK. Meanwhile, the announcement of the US Nuclear Posture Review (NPR) in Feb 2018 provoked negative reactions from Russia and China, the two countries that the NPR described as US adversaries.ⁱⁱ

Indeed, the recent NPR emphasises the centrality of nuclear weapons in national security. It mentions more circumstances in which the US might find it necessary to use nuclear weapons. Simultaneously, new technological developments are being pursued that are currently subject to no limitations. As trust deficit between USA and Russia rises, existing bilateral arms control architecture is the biggest casualty. Meanwhile, China continues to steadily modernise its nuclear capabilities and has become confident enough to boldly display its nuclear prowess. Other nuclear armed states too carry on improving their arsenals in order to meet their vision of credible nuclear deterrence. Scant attention is being paid to the nuclear dangers that are being created in the process.

This article examines the nuclear developments that are currently under way at the global level in order to draw out some implications for India's nuclear policy. It is broadly divided into two sections. The first one identifies nuclear developments in three areas – perceptions related to use of nuclear weapons, emerging technologies, and crumbling arms control. The second section then evaluates the possible implications of these for India. What could be the challenges that these developments would pose for India's nuclear doctrine and capability? How should India react to them? The paper offers a considered evaluation.

Section 1 – Global Nuclear Developments

Perceptions Related to the Use of Nuclear Weapons

The statement made by Presidents Reagan and Gorbachev in 1987 – a nuclear war cannot be won and must not be fought – had underscored the folly of a nuclear exchange and contributed towards strengthening the nuclear taboo or the norm of non-use of nuclear weapons. Over the next almost three decades, it provided a sort of an organising principle for nuclear deterrence and encouraged nuclear reductions since war-fighting with nuclear weapons was seen as self-defeating.

ii For analysis of the US NPR of 2018 see Manpreet Sethi, "US Nuclear Posture Review 2018: Unwisely Re-Opening 'Settled' Nuclear Issues", *India Quarterly*, vol. 74, no.3, 2018, pp 326-336.

In current times, this no longer appears to be the case. Voices arguing in favour of possibilities of limited *use* of nuclear weapons to achieve political objectives appear to have become more voluble. US NPR has made a significant contribution towards this sentiment by ascribing more uses to nuclear weapons rather than restricting their role to the sole purpose of nuclear deterrence. It may be recalled that President Obama's NPR of 2010 had recommended limiting the use of nuclear weapons to "extreme circumstances to defend the vital interests of the US or its allies and partners".¹ So, the nuclear weapons had, at least notionally, moved down the "use" spectrum to being a weapon of last resort to address a narrow range of contingencies. In contrast, President Trump's NPR has expanded the role of nuclear weapons to include deterrence of large-scale conventional threats, cyber-attacks or those against space assets.

USA justifies the need for this by pointing to the increased disruptive capabilities of Russia and China. Russia's ambiguity, cultivated or otherwise, on its right to use low yield nuclear weapons in response to aggression with non-nuclear weapons, widely referred to as 'escalate to de-escalate'ⁱⁱⁱ, is cited as the reason for Washington's search for a "range of limited and graduated options, including a variety of delivery systems and explosive yields."² Russia counter-argues that it was compelled to do so to address the threat created by US conventional global prompt strike (CGPS) involving the use of long-range, high precision delivery systems with non-nuclear weapons. Washington describes their necessity against time-sensitive terrorist targets, but Russia perceives a threat from them for its critical nuclear arsenal or infrastructure.

Whichever country may have been the instigator of this idea of 'limited' use of nuclear weapons to de-escalate a conflict, the effect is that both are today focusing on developing capabilities and options for execution of 'limited' nuclear strikes. In order to make the threat of limited use look credible, the US NPR has spoken of plans to "modify a small number of existing SLBM warheads to provide a low-yield option, and in the longer term, pursue a modern nuclear-armed sea-launched cruise missile."³ This capability has been described as necessary to have diversity in platforms, range and survivability besides being a hedge against future nuclear breakout scenarios and to bridge the perceived "credibility gap", especially in "low yield weapons", to defeat Russia's nuclear strategy.

In a case of rather rapid realisation of this vision spelt out by the NPR, it was reported in Jan 2020 that the US Navy had already deployed a low yield warhead, the W76-

iii There is much confusion about whether Russia has ever claimed this as its nuclear strategy. For an insight into this debate see Olikier, Olga, and Andrey Bakilitsky. "The Nuclear Posture Review and Russian 'De-Escalation:' A Dangerous Solution to a Nonexistent Problem." *War on the Rocks*, February 19, 2018. <https://warontherocks.com/2018/02/nuclear-posture-review-russian-de-escalation-dangerous-solution-nonexistent-problem/>.

2, on its submarine launched ballistic missile aboard an existing SSBN, the USS Tennessee. With a yield of 5-6 kilotons, it is deemed to provide a prompt and assured delivery capability against targets that require a quick response. The National Nuclear Security Administration (NNSA) has been cited to state that the "W76-2 will allow for tailored deterrence in the face of evolving threats" and give the US "an assured ability to respond in kind to a low-yield nuclear attack."⁴ Russia has described this development as destabilising for having lowered the nuclear threshold and indicating an American inclination to wage a limited nuclear war.

As a consequence of these developments, the perception that appears to be gaining ground is that a limited nuclear war with low yield weapons is a credible and feasible military strategy.^{iv} The second section of the article sheds light on the wider implications of this perception, particularly in terms of posing nuclear challenges for India's security.

Emerging Technologies and their Intersection with Nuclear Deterrence

March of technology is a universal constant. Every new development, whether on the offensive side such as greater accuracy of missiles, or on the defensive side such as the deployment of ballistic missile defences impacts nuclear deterrence. In the period under consideration for this article, three prominent developments related to emerging technologies need a careful consideration for how they could intersect with nuclear deterrence.

Hypersonic Delivery Systems

The first of these is the development of hypersonic missiles, a process that has been underway for a long time but which assumed an earnestness in the current decade after the US advancements in deployment of BMD. Russia and China have perceived it as a threat to their nuclear deterrence. Both have decried the US CGPS along with BMD for providing a first strike advantage to the US and thus posing a challenge to their ability to deter. Consequently, both independently felt the need to look for countermeasures to restore their deterrence and decided that hypersonic delivery capability could decisively defeat the BMD. Consistent R & D on this technology has now matured so that at the end of 2019, Russia had announced the induction of its first hypersonic missiles on the Avangard and China displayed its DF-17 in its military parade in October 2019.

Hypersonic missiles, which could be boost glide vehicles or cruise missiles, can fly at speeds of Mach 5-20 through the upper atmosphere. While the existing inter-

iv For more on arguments in favour of this strategy see Matthew Kroenig, Kroenig, Matthew. "The Case for Tactical U.S. Nukes." The Wall Street Journal. Dow Jones & Company, January 24, 2018. <https://www.wsj.com/articles/the-case-for-tactical-u-s-nukes-1516836395>.

continental ballistic missiles (ICBMs) also re-enter the atmosphere and head towards their targets at hypersonic speeds, the current crop of hypersonic missiles brings together the attributes of high speed and 3-D manoeuvrability through the glide phase of the missile thereby making its interception extremely difficult. President Putin has described this as the “invincible” weapon that existing BMD technologies cannot intercept. However, soon after the induction of Avangard⁵, the US Department of Defence has announced a Glide Breaker Project to develop countermeasures against hypersonic missiles. Of course, it is also building an arsenal of its own of the same kind of missiles!

As is evident then, an offence-defence spiral has been set into motion. History of evolution of technology has always shown the tussle between the sword and the shield and the case of hypersonics is no different. The stage, therefore, appears set for arms race instability given that the three major players in this game have the financial wherewithal and technological capability to play it even as there are no ongoing strategic dialogues on arms control. Succumbing to the lure of technology, more countries are also becoming engaged in similar R & D.

Meanwhile, the induction of hypersonics would create other security concerns too. Since these missiles are being added to military capabilities of countries that are nuclear weapon possessors, their implications for attacking the adversary's nuclear assets to degrade retaliation is a natural cause for concern. A further layer of complication is added by the fact that these missiles bring in two kinds of ambiguities – of warhead and destination. In both cases, when an adversary's early warning detects such missiles headed in its direction, but it cannot be sure whether they are conventional or nuclear armed, nor ascertain the exact target they are headed towards, the tendency would be to assume the worst. For an adversary that faces a country with a BMD but itself has a small nuclear arsenal, it would legitimately fear that even conventionally armed hypersonic missiles could be used to mount a surprise attack on its nuclear forces or NC₃. The tendency could then be to shift to more trigger ready postures such as launch on warning or launch under attack to ostensibly enhance deterrence. But, such shifts would also raise risks of misperception and miscalculation in moments of crisis and prove highly destabilising.

Another implication of this development would be to take the offence-defence developments into outer space. Counter-measures to hypersonics have been envisaged through placement of sensors and interceptors in outer space. While none of this is going to be easy or quick, weaponisation of outer space would, nevertheless, be a distinct possibility once hypersonic inductions become the norm.

To sum up then, it could be said that induction of this technology would bring in a phase of technology exuberance with a perceived advantage of offence dominance. But, since this is a game between nuclear armed nations that are not sharing the best of political relations, are suffering from high trust deficits and have lowered thresholds of nuclear use, ambiguity inherent in this technology will place a cost on strategic stability. It will end up creating further security dilemmas. "Therefore, it would likely prove to be a case of a transitory advantage eventually leading nations into a strategic trap."⁶

Possibility of Cyber Disruptions of Nuclear C₃

Given the high dependence of nations on rapid collection, processing and transmission of data for military command and control, it is not surprising that attacks on data are seen as normal targets to blind/blunt war fighting capability. But, the fear of an attack on nuclear command, control and communications (NC₃) could end up reducing the threshold for use of nuclear weapons. Cyberattacks could lead to situations that might compromise the negative controls over nuclear C₂ by instigating pre-emption through false alarms or misinformation fed into the system. At the same time, they could also affect positive controls by not allowing launch activation by jamming/corrupting or fooling the system. The very fear of such compromise of nuclear C₂ could compel nations to adopt risky nuclear postures thereby posing a threat of an inadvertent nuclear war. It could make a country panic during a crisis and encourage a tendency towards pre-emptive strikes in order to avoid being adversely affected by cyber disruptions. These vulnerabilities created by the digital age⁷ evoke the possibility of loss of control over a situation and hence may lead to nuclear escalation even when a side realizes that there is nothing to be gained by striking first.

Another cyber related challenge arises when nations have dual-use command and control systems. Though such a step may be taken to cut costs or avoid unnecessary duplication, but it nevertheless creates risks of ambiguity and entanglement. This danger has been well explained by James Acton, a nuclear analyst⁸, who described a scenario where an attack on an adversary's command and control nodes is undertaken to influence the outcome of a conventional conflict, but which may end up inadvertently degrading his nuclear capabilities owing to its dual use nature. This could then set into motion a set of unintended escalatory developments. A similar challenge could be posed by cyber disruptions to dual use sensor networks such as satellites used for early warning, communication and ISR or ground based radars and transmitters. It is not surprising, therefore, that the US NPR 2018 warns adversaries that Washington would consider using nuclear weapons in the event of "significant non-nuclear strategic attacks... on US or allied nuclear forces, their command

and control, or warning and attack assessment capabilities.”⁹

However, not everyone is convinced that nuclear retaliation against a cyberattack could be a wise move. Not only would attribution of a stealthy cyberattack not be easy, nuclear retaliation in such case would bring back a nuclear response and only make the situation more difficult. Notwithstanding the undesirability of nuclear response to cyberattacks, the fact of the matter is the growing danger of such disruptions and the nuclear postures that they might compel nations to adopt.

Application of Artificial Intelligence in Nuclear Systems

Many decades back, Lawrence Freedman, a prominent nuclear strategist had warned that “To the extent that AI influences perceptions of intent and capability and alters the calculus of risk and reward, it will inspire new thinking about possible offensive and defensive manoeuvres in the evolution of nuclear strategy.”¹⁰ That time seems to have come.

Military applications of AI in the fields of robotics, autonomous vehicles, supercomputing and quantum computing are growing by the day. Nations obviously perceive many opportunities here for enhancing their data collection and analyses for multi-domain situational awareness, decision support, etc. Better information, it is presumed, would lead to better informed decisions and enable precision targeting, including by autonomous weapons operating in any medium – land, air, sea, or even space and cyber. Intelligent systems are also believed to have the capability to evade all defences and thereby enhance deterrence.

On the negative side, however, the risks of greater and greater reliance on AI or machines especially in nuclear decision making are not few, and perhaps not even fully understood yet. In fact, while some nations may sense a deterrence enhancing advantage through AI in order to signal certainty of retaliation (akin to what the USSR had done with the idea of Dead Hand), their adversaries might find the high AI dependence threatening. For instance, AI enabled ISR and automated target recognition would heighten threat perceptions over one's nuclear assets and lead to increased instability in crises situations. This may compel nations to put their own nuclear forces on hair trigger alert or tempt them to use nuclear weapons first and early in conflict for fear of losing them. In the nuclear game, an adversary who feels cornered or on the edge can be more dangerous than good. Therefore, AI could end up magnifying concerns of deterrence instability and escalation management by leading to a possible loss of human control over use of force.

Much intelligence will have to be shown by humans on how they deal with the challenges of artificially created real intelligence. Given that AI technologies are still in the making it is difficult to envision all possible military applications and exact positive or negative ramifications. But, to the extent that AI increases speed and precision of targeting, undercuts the sense of mutual vulnerability and strengthens the sense of one side being able to overwhelm the other's deterrence, it could prove to be destabilizing. Such tendencies could tempt pre-emption in order to prevent strategic surprise early in conflict and cause an unwanted nuclear exchange. Therefore, utilization of AI on the battlefield needs to be intelligently managed for its benefits with a clear eyed recognition of the risks.

Crumbling Nuclear Arms Control

During the Cold War, there were several tense moments when the nuclear Superpowers came to the verge of nuclear blows. These gave birth to a shared sense of dangers and eventually led both sides to engage in negotiations on arms control. Of course, the agenda of arms control was always strictly guided by national interests and none conceded any ground. But a set of agreements were painstakingly concluded to build a system that, as said by two senior former US officials, "for decades provided restraint, transparency, and predictability for each side's conventional and nuclear forces."¹¹

Since the turn of the millennium though, the arms control treaties have seen more dismantlement, piece by piece, for one reason or another. It started with the US abandonment of the ABM treaty in 2002. Five years later, Russia suspended its membership first of the Conventional Armed Forces in Europe treaty, and later of START 2. Since 2014 allegations have been made by the US against Russia that it had been violating the Intermediate Nuclear Forces (INF) treaty. The treaty finally ended in August 2019 with the US withdrawal. The only bilateral arms control agreement still alive is the New START treaty that is due to expire in 2021. No moves have yet been made for its extension. Amongst the multilateral nuclear arms control agreements, the CTBT has been in come since 1999 when the US refused to grant it ratification. The FMCT has seen no signs of revival either. In sum, then, the arms control scene looks quite grim as at least three of the major nuclear weapon states are focusing on new weapon systems and a modernization of their nuclear arsenals.

One sees little possibility of a change in these trends without US-Russia relations moving towards better trust or confidence. Rebuilding a working relationship between Washington and Moscow will need political direction from the top besides a concerted follow up at the level of bureaucratic professionals. As it stands in the early part of 2020, Presidents Trump and Putin are concentrating on domestic agendas, with the former getting his game together for his re-election later this year, and the latter focussed on

domestic political changes.

China, meanwhile, now represents a very important third dimension of this issue. It is unlikely that USA and Russia will conclude any major arms control agreements without the participation of China. But, Beijing still maintains a hard-line position on this and has refused to participate in any such negotiations. However, some Chinese scholars have begun to argue that "over time, China's own interest will align with arms control for several reasons."¹² Tong Zhao, for instance, recommends, "Beijing and Washington should set some basic boundaries to their competition... To this end, they both must commit to maintain strategic stability, avoid a repetition of a Cold War-style arms race, and agree on red lines and basic rules of major power competition."

Despite all its imperfections, the NAC architecture was a framework whose loss will have implications for international security. The vacuum so created is being filled by an atmosphere of 'free for all' or nuclear cacophony that is allowing an offence-defence spiral as countries pursue the concept of absolute security. The idea of mutual vulnerability that underwrote nuclear deterrence, and which was sought to be enshrined through the NAC, appears to be a casualty of the process.

Section 2 – Implications for India's Nuclear Policy

A Press Note of the Cabinet Committee on Security in 2003 spells out India's nuclear doctrine. This is a set of guiding principles that provide direction for capability building and signalling deterrence. Prominent in India's nuclear doctrine are the attributes of credible minimum deterrence and no first use backed by the idea of massive retaliation to cause unacceptable damage. Over the last two decades, the country has progressed towards realizing its vision of credible deterrence. The focus of this task obviously comes under the influence of the developments going on at the global level. In such circumstances, it is imperative that their impact be assessed correctly to arrive at the right conclusions on what, if any, changes may be needed in India's nuclear policy. This section makes four recommendations on how India should address the changing global nuclear landscape.

No Doctrinal Change Necessary

The idea of tailored deterrence has an appeal for militaries everywhere. However, such an approach overlooks the fact that nuclear weapons are not ordinary weapons to do the conventional kind of war-fighting. In fact, for those who are swayed by the idea of 'tactical' nuclear weapons to fight limited wars, the question that needs to be asked is what

implies limited war with use of nuclear weapons when the effects of radioactivity cannot be constrained in time and space? How can any nation guarantee that its own 'limited' nuclear weapons use would be honoured by the other side with a similar response?

There is no evidence to prove that what may be started by one nation as a limited use of nuclear weapons in its mind will not quickly spiral out of control. It is for this reason that the very idea of such use had been discredited in the 1980s. The re-emergence of this concept at a time when new technologies are bringing in not-well-understood dimensions to nuclear deterrence makes it doubly essential that tendencies that promote the idea of limited nuclear use are contested and quashed. In fact, this is necessary not just in India but it would also be worthwhile to force a collective commitment to constrict the role of nuclear weapons in national security strategies of all nations to eschew the idea that limited nuclear strikes could be more acceptable than larger nuclear strikes. The nature of nuclear weapons and the damage this would cause to the socio-economic, political and psychological fabric of inter-state relations cannot support this idea.

In fact, tampering with the taboo against the use of nuclear weapons, even if low-yield or limited, would only end up opening more possibilities of use. There is no guarantee that nuclear weapon possessors would stop after limited nuclear strikes, or that this trend would not spread across regions. Indeed, this is a slippery slope and best arrested. The idea that some kinds of nuclear attacks could be carried out with surgically precise accuracy or extremely low yields to make them 'benign' enough to escape retaliation is a foolish assumption.

India stands protected against the possibility of *any* nuclear use by its doctrine of massive retaliation. To argue that 'limited' nuclear weapons response with low-yield weapons would be more credible in the eyes of the adversary is to take the first step towards accepting the idea that the adversary's first, 'limited' use would be tolerated and responded to in a proportionate manner. This idea of war-fighting with nuclear weapons is exactly what the Indian nuclear doctrine wisely jettisoned by suggesting that the non-ordinariness of nuclear weapons demands an extraordinary response. In the face of emerging tendencies to popularise the idea of limited nuclear strikes, India must not only stand steadfast on its understanding of nuclear deterrence as being best derived from the imposition of unacceptable punishment, but also expose the folly and dangers of such misguided ideas.

Capability Build-Up – Focus on Survivability & Avoid Arms Race

India's nuclear doctrine has an oriental, minimalist approach which is rooted in the basic understanding that nuclear weapons are political instruments meant for deterrence.

Fighting wars with them is meaningless. The capability requirements of such a strategy are demanding in their own way, but limited nevertheless.

With India's nuclear armed neighbours moving to new capability milestones, the challenge for India is to decide the optimal extent and nature of its capability build-up. The answer to this lies in understanding that in the game of nuclear deterrence, not every increase in nuclear numbers or capability needs to be addressed by a matching development. While a close watch on adversary's capability build up is a must, every development need not trigger similar steps. The country must retain its focus correctly on its own nuclear hardware requirements to avoid wasteful expenditure of limited resources. For instance, since India maintains nuclear weapons only as a strategic deterrent and upholds an extremely high threshold for use, there is no requirement for low-yield warheads. Capabilities that suggest making nuclear weapons more "usable," should not be incorporated.

At the same time, given India's NFU posture, the country's focus must be on ensuring survivability of its nuclear forces. This implies the need to maintain a stockpile of nuclear weapons that is safe, effective, and reliable. In fact, the right use of the new technologies (hypersonics, AI and cyber) in the case of India should be to enhance survivability of nuclear forces and command and control. Meanwhile, retaining focus on the following aspects is critical:

- Highly survivable set of delivery platforms of adequate ranges across the triad
- Robust C4ISR (including through redundancies in space) to enable mixed targeting (counter-value and counter-force)
- Navigation support systems (including space) to assure accurate targeting
- Hardened NC3 with adequate redundancies to cater for cyber challenges
- R&D, not deployment, of hypersonic technologies to address future challenges being posed by China's BMD

Deterrence is based on the ability to cause unacceptable damage and dense population conglomerates in Southern Asia make imposition of unacceptable punishment easily possible with fairly low warhead numbers atop even low accuracy delivery vehicles. By following the nuclear basics of survivable second-strike capabilities and credible minimum deterrence, India can avoid a wasteful, dangerous competition in unnecessary capabilities.

Finding Opportunities for Nuclear Engagements

While India was never part of the bilateral nuclear arms control architecture, the demise of the various treaties that comprised it does impact international security and hence is a matter of concern for India. It will be in India's interest if the major nuclear powers were to arrive at some kind of arrangements that engender greater confidence building and improve inter-state relations especially by way of reducing nuclear risks especially of inadvertent escalation variety.

Meanwhile, as far as India's own participation in any such initiatives is concerned, it must try to explore opportunities for nuclear risk reduction with an open mind. In fact, in the current circumstances where multilateral arms control appears extremely difficult, one meaningful engagement that may be possible might actually be between India and China. Of course, this is not to overlook two major hurdles that currently stand in the way. The first of these is the relationship between Washington and Beijing. With its eyes firmly set on its threat perceptions from the US, Beijing does not want to bind itself to any agreements that might constrain its future capability. The second obstacle pertains to China's loyalty to UNSCR 1172 that seeks a rollback and elimination of India's and Pakistan's nuclear weapons. But, it is most likely that as India's nuclear capability grows and is more credibly deployed against China, Beijing will see sense in engagement in nuclear issues to address the risks. If any agreements are worked out between these two nations, it could have a benign impact on the India-Pakistan relationship too.

Therefore, it should be in India's interest to augment its understanding of NAC as a security enhancing process that can help transcend zero sum relationships. Nuclear arms control is not so much about eliminating a weapon system as it is about shaping a predictable nuclear relationship through a kind of managed transparency that helps avoid strategic planning based on worst case scenarios, miscalculations and perceptual errors. India must try to look for opportunities that can help inculcate habits of engagement, produce insights into each other's strategic thinking and help foster a shared understanding of key concepts and dangers.

Continuing Pursuit of Nuclear Disarmament

India has been a champion of universal elimination of nuclear weapons for a long time. It has offered concrete proposals with steps leading to this objective in the past based in the belief that such a world would be a more secure one and will make non-proliferation sustainable. Given the rise in nuclear risks in the contemporary times, it looks even more imperative that efforts in this direction continue. Today we inhabit a world where far more

numbers of states have nuclear weapons; where nuclear modernization is taking place in times of strident nationalism; where nuclear possessors speak of nuclear "fire and fury" in a rather cavalier fashion; where the possibility of non-state actors acquiring nuclear material or weapons for terrorism, either with or without state complicity have multiplied; and where inter-state relations are mired in mutual mistrust.

As the global nuclear world stands today, interest of the NWS in elimination of nuclear weapons is abysmally low. In some sense, the Ban Treaty that was passed in the UNGA in 2017 with 122 votes in favour was a depiction of the sense of frustration of the NNWS to be unable to get the NWS to work towards disarmament. However, the manner in which the treaty came into being and had outlawed nuclear weapons without preparing the necessary ground for inclusion of NWS became its bane too. A nuclear weapon free world cannot appear overnight. Nuclear deterrence has taken deep roots over seven decades. It will need more than just a ban to get nations to give them up. It will need a change in belief systems behind their utility.

India could contribute towards popularizing this approach by pressing for a restriction on the role and circumstances of use of nuclear weapons. Acceptance of the ideas of sole purpose of nuclear weapons as only for deterrence of similar weapons and of no first use could be meaningful first steps to start the process. Both would allow nuclear armed countries to retain their nuclear arsenals for protecting their notional sense of security, and yet at the same time, reduce the value of the weapon and encourage further movement towards nuclear disarmament. Even though the prospects of getting to a nuclear weapons free world appear dismal in the current circumstances, India nevertheless must continue to find opportunities and fora to push for it since it would not only be in its but everyone's long-term interest to inhabit such a world.

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