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UNDERSTANDING NUCLEAR POSTURES, WEAPONS AND TECHNOLOGIES IN SOUTH ASIA

Roshan Khanijo[1]

Geographic realities and emerging technologies play a significant role in challenging strategic stability. In South Asia, the geographical proximity of India, China and Pakistan is exacerbated by contentious borders, deteriorating diplomatic relations and the mounting collusive Pakistan-China relationship. This dynamic environment merits an analysis of evolving nuclear postures, weapon systems and the development of new technologies, which may challenge strategic stability. Furthermore, tactical nuclear weapons, unmanned weapons and asymmetric warfare, have a tendency to escalate situations and to impact confidence building measures. This essay examines the nuclear postures and weapon systems of China and Pakistan and recommends methods to maintain the status quo.

Key Words: emerging technologies, strategic stability, second-strike capability, full-spectrum deterrence, asymmetric warfare

Introduction

India is geographically flanked by two nuclear-armed states, China and Pakistan. Aside from the prevalent border disagreements among these states, the past few years have also witnessed a significant degradation of diplomatic relations between China and India with crises unfolding in Doklam and the Galwan Valley.[1] Any nuclear discussion analysing the threat environment of South Asia, therefore, must also include the nuclear positioning of China. The traditional methods of discussing South Asian relations from a purely dyadic India-Pakistan perspective have become obsolete. Insisting on regional compartmentalisation could lead to short sightedness when examining inter-state communication and positioning.

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Further, the geographic realities must be weighed against the significant global revolution in the realm of emerging technologies.[2] These technologies possess the ability to change the nature of conflict altogether, threatening the precarious strategic stability in the region. This is even more salient in South Asia in light of the close relationship between China and Pakistan, under which the former serves as a major arms exporter to the latter. In fact, Pakistan has been the main recipient of Chinese exports from 1990s. If accounting for the data over just the last few years, Pakistan has received 35 percent of China's total arms exports from 2015-2019.[3] Given the rapid rate of China's military modernisation, there is a distinct possibility of emerging technologies inevitably making their way to Pakistan.

In light of these interrelated trends, it is imperative to discuss South Asian nuclear challenges in a trilateral manner. Globalisation has impacted the way nation states interact with each other, and nuclear weapons can no longer be assessed from the lens of a country's nuclear posture alone. The intersection of commercial and military interests ensures that there is a constant cross-fertilisation of policy decisions, as countries respond to threats and incentives from neighbours and competitors on the global stage. Any new technology has a cascading effect. For example, the development of weapon technologies by the United States and Russia in the past, as with the development of ballistic missile defence (BMD) and multiple independently targetable re-entry vehicles (MIRVs) often gave China a reason to compete to develop similar weapons, which has had an effect on threat perceptions and balancing within South Asia.

Furthermore, India's ongoing border disputes with both Pakistan and China provide a baseline for skirmishes to escalate extremely quickly. India cannot afford to have a large technological gap as this will embolden its adversaries to adopt a more provocative stance through the use of emerging technologies and intensify asymmetric warfare. This, in turn, could adversely affect the delicate status quo within the region and may impact the nuclear deterrence, considering there is an absence of credible confidence building measures (CBMs) between the countries. Given this interconnected tapestry, a genealogy of conflict in South Asia must examine the interlinkages between the various countries rather than their individual projections in silos. As such, this essay will unravel the nuclear postures and emerging technologies of Pakistan and China and their impact on strategic stability in the region.

Pakistan's Nuclear Posture and Weapon Systems

Nuclear posture and nuclear weapon trajectories generally feed off and complement each other. Countries often modify their nuclear postures based on the incorporation of emerging technologies. This is evident in Pakistan's nuclear posture, which has undergone a change over the years under in its evolution from a dynamic concept of minimum

credible deterrence to full-spectrum deterrence, which suggests a range of deterrence options from tactical nuclear weapons to conventional submarines with nuclear-tipped ballistic missiles, cruise missiles to defeat missile defence, among other options.[4]

Pakistan's nuclear evolution has led to development of weapon systems, such as the Shaheen-III medium range ballistic missile (MRBM), Ababeel MRBM, Hatf IX/Nasr tactical ballistic missile, which demonstrate a range of strategic and tactical platforms. In particular, with the emergence of tactical nuclear weapons (TNWs) Pakistan has lowered the nuclear thresholds and the response options. This is due to the fact that these weapons would lead to a state of hair-trigger alert, bringing nuclear instability in the region.

Another destabilising factor is that Pakistan does not subscribe to a no-first-use (NFU) posture. The use of nuclear weapons in a conventional war lowers thresholds, yet Pakistan continues to ascribe to their utility as a low-cost strategy for it to maintain an asymmetrical warfare advantage.[5] Complications from such a strategy are fourfold. First, repeated political threats of nuclear escalation with TNWs serve as a false narrative that creates instability in the region. Second, Pakistan's TNWs use of plutonium as their fissile material serves as a rationale for Pakistan to enhance its reprocessing capabilities and to increase its number of nuclear warheads. Third, the risk of terrorists acquiring TNWs is greater than with strategic weapons, in particular since Pakistan has a number of terror organisations residing in its territory. Fourth, during a conflict or in a pressure situation, the delegation of authority associated with TNWs increases the possibility of accidental use.

As nuclear postures intersect with weapon systems, India is faced with various challenges in its attempt to maintain a status quo approach to strategic stability.[6] Central among these is Pakistan's development of the Hatf IX/Nasr.[7] Such low-yield nuclear weapon systems pose dual risks of warhead management, as well as command and control concerns. Aggressive manoeuvring and escalation would be exceedingly difficult, if not impossible, to control with nuclear weapons that operate at such a low yield and low threshold under flexible response.[8]

Facing these dangers, India has clearly articulated that it has a posture of NFU and nuclear weapons will only be used in retaliation against a nuclear attack on Indian territory or on Indian forces.[9] Within this formulation, however, India does not differentiate between tactical and strategic weapons. Aggressive posturing with TNWs would be construed as nuclear escalation. Beyond TNWs, Pakistan is testing MIRVs that will enhance its targeting options, leading to arms racing and further diminishing strategic stability. Further, Pakistan's plans for ship-borne nuclear cruise missiles systems could offset the peace that currently prevails in the Indian Ocean, as a greater number of tactical nuclear assets increase the chance of accidents and terrorist threats, which may lead to uncontrolled nuclear escalation.

The final challenge relates to Pakistan's use of non-state actors within asymmetric warfare to create instability. Over the years, Pakistan has continually relied on non-state actors to engage in violent attacks in India, leading to civilian casualties. The Indian Parliament attack in 2001, Mumbai attack of 2008, the Uri attack in 2016 and the Pulwama attack in 2019 are some of the examples in which Pakistan-based terror organisations like Jaish-e-Mohammed and Lashkar-e-Taiba have tried to create problems. However, India's response with the Uri and Balakot surgical strikes have demonstrated that India's posture of defensive offence may be used in countering such moves in the future.[10] If Pakistan continues with its strategy of asymmetric escalation, there is the chance that these will converge into conventional war and the chance of nuclear escalation, while remote, cannot be ruled out. Further, these incidents create an overall trust deficit that stalls CBMs in the region. Though India and Pakistan still regularly share their lists of nuclear installations, meaningful political CBMs are lacking.[11]

China's Nuclear Posture and Weapon Systems

As far as nuclear relations between China and India are concerned, thus far, there has been nuclear restraint on both sides. The main reason for this is the fact that both nations have a posture of NFU, which maintains that they will not be the first to use nuclear weapons as they consider them solely to deter against an adversary's nuclear attack.[12] Currently, both countries do not believe in lowering their nuclear threshold and in using nuclear weapons as political tools. However, they still face tensions, as observed during the recent crisis in the Galwan Valley that led to fatalities and aggressive deployment of conventional weapons. Such high intensity border clashes can complicate situational awareness leading to risky manoeuvres.[13] For example, evidence of China's deployment of its DF-26 intermediate-range ballistic missiles (IRBMs) near the border during the crisis could be viewed as an escalatory action.[14] This is because of DF-26 IRBMs, are precision-strike dual-capable weapons that can be armed with conventional or nuclear warheads.[15]

Further, while China and India have not generally engaged in overt political posturing, future issues could arise due to the entanglement of conventional and nuclear missiles at the theatre level. Dual-capable DF-21 MRBMs deployed by China in the Xinjiang Uygur Autonomous Region may complicate the perception of its commitment to maintaining the nuclear threshold and to avoiding escalation.[16] Moreover, while 'China's National Defense in the New Era' from 2019 continues to maintain a posture of NFU, other publications such as *The Science of Second Artillery Operations* from 2004 have highlighted the four conditions under which China may consider lowering the nuclear threshold.[17] Further, the news of China drastically increasing the number of nuclear silos questions the policy of NFU, as well as the intention of such a move. Its construction of at least 250 new missile silos at three locations fuels concerns that it aims to substantially expand its nuclear weapons arsenal.[18]

Another key trigger for India is that China is undergoing deliberations on the development of rapid response capabilities that contribute to its nuclear modernisation.[19] Among these, China is attempting to fine tune its strategic warning capabilities, as noted in its 2015 white paper 'China's Military Strategy'.[20] To achieve this, China is developing a space-based early warning system that would enable China to shift to a launch-under-attack alert status if it chose to do so in the future.[21] This would again throw into question China's NFU posture. China has also actively been pursuing plans to recycle its spent nuclear fuel, as indicated by the China National Nuclear Corporation beginning construction on a larger demonstration reprocessing plant at the Gansu Nuclear Technology Industrial Park in 2015.[22] While this growth is embedded within China's civilian nuclear sector, concerns remain as to what China will do with the large amount of weapons-useable plutonium generated.

Furthermore, the development trajectories of Chinese weapons have been focused on local conflicts, which is of direct import for India. Among these, China is expanding its inventory of the multi-role DF-26 IRBM that is capable of rapidly swapping conventional and nuclear warheads, as well as conventional strikes against naval targets.[23] To strengthen its nuclear triad in the air domain, China is developing the Xian H-20 nuclear-capable subsonic strategic stealth bomber, which could enter service as early as 2025.[24] Additionally, the Jin-class ballistic missile submarine (SSBN), which can carry the JL-2 submarine-launched ballistic missile (SLBM), followed by the more capable and longer-range JL-3 SLBM, will enable the People's Liberation Army Navy to target adversaries from littoral waters.[25] China also has a large inventory of cruise missiles, including the DH-10 land-attack cruise missile (LACM) that can reach subsonic speeds and travel up to 2,000 kilometres with a payload of 500 kilograms.[26] This expanding arsenal with dual-capable platforms will destabilise threat perceptions and challenge the nuclear deterrence of other nation states, contributing to the genesis of a nuclear arms race.

Emerging Technologies and the Future of Strategic Stability

Beyond traditional nuclear postures and weapons systems, emerging technologies promise to upend strategic stability in South Asia. These innovations challenge nuclear thresholds for two key reasons. First, the development of emerging technologies like hypersonic glide vehicles, advancements in artificial intelligence (AI) and automated systems, as illustrated by the development of dual-capable unmanned underwater and aerial systems by the United States and Russia promises to have a cascading effect on South Asia. China's technological advances are fuelled in part by competition with the United States, carrying over an impact on threat projections within South Asia. Thus, while China may seek to counter global hegemony, these technologies can also be used in local conflicts to create an atmosphere of fear and asymmetry.

If the technological gap is allowed to expand unchecked, then this will embolden stronger countries to behave more provocatively. As a result, the weaker countries would have no option but to pursue a range of emerging technologies to offset their lack of a credible nuclear deterrent. One such area is AI and autonomous systems, in which the proliferation of a broad range of AI-enabled autonomous weapon systems, including unmanned systems used in swarming tactics, could have far-reaching strategic implications for nuclear security and escalation in future warfare.[27] From India's perspective, this threat is compounded due to the bond between China and Pakistan. This dynamic could lead to a situation in which China may be compelled to share its emerging technologies with Pakistan resulting in an extended and escalated arms race.

A clear example of this cascade effect and China's direct impact on South Asia is evident in the US development of BMD systems, which have compelled other countries to consider developing MIRVs in response. China has not been alone in developing MIRVs, as Pakistan in 2017 conducted a flight test of its Ababeel MRBM, which is reportedly equipped with MIRV technology and is reportedly based on the M-11 variant of China's DF-11 short-range ballistic missile (SRBM).[28] Similarly, in the maritime domain, cruise missiles on ships and submarines will also challenge strategic stability in the Indian Ocean. The initial stages of this can be seen with Pakistan's test firing of the Babur-III, a nuclear-capable, submarine-launched cruise missile (SLCM).[29] The future development of dual-capable underwater unmanned systems by China could offset the second-strike capabilities of other countries. Such developments could follow US autonomous systems like the Sea Hunter unmanned surface vessel, which may render the underwater domain transparent.[30] If successful, such systems would erode the second-strike deterrence utility of stealthy SSBNs, yet the technical feasibility of this hypothesis remains highly contested.[31]

In terms of other technology flows, reference in the 2018 US Nuclear Posture Review to low-yield submarine launched ballistic and cruise missiles may have already begun pushing other countries towards re-examining their own nuclear strategies.[32] Even prior to the release of this official US document, China has demonstrated interest and investment in autonomy through 'low-cost swarms of unmanned aerial and underwater vehicles, along with cyber technologies', which 'could provide a "guerrilla combat-style" advantage against systems that the United States sees as providing an element of surprise, speed, and precision'.[33] The overall integration of AI and autonomy in offensive and defensive strategic defence systems also has the potential to cause strategic instability. China's focused approach in the development of AI-enabled offensive platforms is visible in the development of hypersonic glide platforms, as well as unmanned aerial vehicles (UAVs) and unmanned combat aerial vehicles (UCAVs).[34] China's work on the An Jian, Li Jian and CH-7 are just a few examples of potential UCAV prototypes.[35] Further, its development of the DF-ZF hypersonic glide vehicle (HGV), reportedly mounted on the DF-17 MRBM, may also be dual-capable.[36] These weapons, could cause a compression

of decision and response timelines. The low-gliding altitude of the HGV compared with that of a similar range ballistic missile, make it much more difficult for radar or other line-of-site sensors to detect, further creating instability in South Asia.[37]

In addition to its impact on speed of exchange, the integration of greater AI and autonomy also has the potential to enhance the capabilities of developing early warning systems, as also improving the intelligence, surveillance, and reconnaissance (ISR). Mobile ISR platforms as with UAVs or unmanned underwater vehicles (UUVs) could process data on-board and identify by itself not only signals or objects, but also situations of interest, such as an unusual movement of troops, weapons or equipment.[38] Enhanced data-processing capability can assist military commanders in predicting developments related to nuclear weapons, including the possible production, commissioning, deployment and use of nuclear forces by an adversary.[39] In particular, unmanned systems are marked by their financial feasibility, non-labour-intensive requirements, as well as their increased range and improved durability. China has unveiled an unmanned underwater vehicle that can reportedly recognise, follow and attack an enemy submarine without human instruction.[40] When such capabilities are integrated alongside combat functions, their impact on both conventional and nuclear stability will be even greater.

The uncontrolled spread of these weapons and technologies to countries surrounding India could create significant instability. While the application of AI in ISR could enhance defensive detection and tracking of adversaries' mobile- and silo-based nuclear weapons, this same improvement in surveillance and data collection could render one's own second-strike capability vulnerable to early detection and attack. Overreliance on and overconfidence in improved ISR capabilities could also lead countries to adopt increasingly escalatory launch on warning options. Overall, increased emphasis on autonomy over human control and supervision in the chain of nuclear command and control could lead to an overall heightened sense of vulnerability through black box attacks, hacking and manipulation of data, all of which could be projected as threats in the absence of well-established CBMs, again threatening strategic stability within South Asia.[41]

Conclusion

In terms of India-Pakistan relations, the only way to address escalatory tendencies and mistrust is through the creation of an environment of open dialogue and discussion. Nuclear brinkmanship will only lead to further volatility within South Asia. The establishment of constructive and regulated communication and protocols, however, can only take place when the diplomatic and strategic environment is stable. The use of non-state actors for violent attacks incites tremendous mistrust. In such an environment, CBMs cannot be instituted. For constructive CBMs to happen both countries need to take a step forward in deescalating tensions. A truce deal by calling for the

cessation of ceasefire violations on the Line of Control and the international border is a good start and allows the space to look for ways to mitigate terrorism and look for durable ways to peace in the region.[42]

As far as India-China relations are concerned, due to the recent border clashes in the Galwan Valley and growing hostility between the two countries, it is perhaps time to deescalate the situation. The process has already started and the disengagement between India and China in the Gogra Heights area of eastern Ladakh has been completed, as both sides have returned to their permanent bases.[43] However, a great deal remains to be achieved as both countries need to resolve remaining issues along the Line of Actual Control in the Western Sector. To bring better stability it is time that India and China both consider organising bilateral nuclear CBMs. For this to occur, China needs to recognise India as a legitimate nuclear weapon state. Finally, aside from these dyadic mediations, in order to create and sustain a peaceful global environment, trilateral and multilateral forums should also be explored to address the aforementioned shifting nuclear postures, weaponry and technology developments.

The nuclear challenge in South Asia is much more intricate than it appears, such that complexities and nuances must be addressed holistically. Aside from the geographical proximity of the various nation states and their historical legacies, the rapid introduction of emerging technologies has exacerbated the traditional cascade effect of shifts in nuclear posture and advances in weaponry. At present, the region is on the verge of a crossroads. De-escalatory choices exist for India, Pakistan and China, but these will depend upon their cooperation and willingness to engage with other nuclear-armed states. Just as the globalised world is increasingly interconnected economically, so too must nuclear networks be seen in the context of the larger ebbs and flows of global geopolitics. The absence of a holistic outlook that takes into consideration interlinkages among nuclear posture, weapons and technologies could result in overly narrow approaches that miss how these escalatory cascades are impacting South Asia.

1 In the case of Doklam, the construction of the road inside Bhutanese territory was a direct violation of the 1988 and 1998 agreements between Bhutan and China and affected the process of demarcating the boundary between these two countries. In the case of the Galwan Valley, China has been hindering India's normal, traditional patrolling pattern in Galwan area, resulting in a face-off, which was addressed by the ground commanders as per the provisions of the bilateral agreements and protocols. Ministry of External Affairs, 'Recent Developments in Doklam Area', Republic of India, 30 Jun. 2017, <https://www.mea.gov.in/press-releases.htm?dtl/28572/Recent_Developments_in_Doklam_Area>.

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