The New Emerging Technology Cyber Capabilities: Prospective Hazards on Deterrence Stability between India and Pakistan

Adeela Ahmed
Ph.D. Scholar, School of Integrated Social Sciences, the University of Lahore, Lahore Pakistan
Email: adeelaahmed6@gmail.com

IJKS: Vol. 7 - No. 1/2025

The New Emerging Technology Cyber Capabilities: Prospective Hazards on Deterrence Stability between India and Pakistan

Adeela Ahmed
Ph.D. Scholar, School of Integrated Social Sciences, the University of Lahore, Lahore Pakistan
Email: adeelaahmed6@gmail.com

Abstract

The growing development and deployment of emerging disruptive technologies like cyber capabilities brings new challenges to deterrence stability in South Asia in the third nuclear age. This paper intends to explore cyber insecurity and modern warfare in the presence of core bone of contention the Kashmir conflict. In the south Asian strategic environment, India and Pakistan perceive cyber threats as steering toward critical infrastructure. In the current geopolitical environment, among nine nuclear weapon states like India and Pakistan in addition are modernizing their cyber capabilities. In that context, the use of grey zone and electronic warfare strategies complicates the already fragile mutual trust and deterrence framework.   The paper investigates how deterrence

_____

stability in South Asia is being impacted by the use of new technologies, including network-centric warfare, which is shifting traditional armed maneuvers. The study gives insight that without guardrails the use such tactics will destabilize stability and making it more complex to lead towards Peaceful resolution of Kashmir issue. The study used a qualitative method and data points of the academic research are policy documents, expert interviews, and media coverage. The study brings novelty in its strategic analysis by using method of comparative case study. The findings will highlight how a cyber-nuclear risk without the resolution of Kashmir issue is putting the region under catastrophic danger. It should be comprehended that policymakers, practitioner to work on mechanisms in the face of developing technologies that can mitigate nuclear risks.

 Key Words: Emerging Technologies, Cyber Warfare, Net-centric, Nuclear Deterrence, Strategic Stability, India, Pakistan .

Introduction

India and Pakistan horns are lock since eight decades due to protracted history of conflict and crises.[1] At the backdrop of enduring rivalry, India and Pakistan fails to institutionalize nuclear risk reduction measures which are integral of any rivalry states and

---

[1] Muhammad W. Haider and Tahir M. Azad, "The Role of Confidence-Building Measures in the Evolution of Relations between Pakistan and India," World Affairs 184, no. 3 (2021): 294–317.

IJKS: Vol 7 No. 01/2025

Adeela Ahmed: **The New Emerging Technology Cyber Capabilities:** Prospective Hazards on Deterrence Stability between India and Pakistan
_____

particularly of thehistory of high frequency of crises like seven crises in last three decades.[2]

In the absence of trust and a high frequency of blame, states often find themselves in crises. Furthermore, a perilous aspect is the willingness to utilize non-traditional capabilities that have the potential to target critical infrastructure.[3] The nuclear deterrence that anchors states to avoid targeting essential infrastructure and sets norms to discipline it, but if the reverse situation erupts and both states fail to rethink norms and ethical guardrails, and instead continue to increase the use of emerging technologies like cyber capabilities. It brings new challenges to deterrence stability in South Asia.

Since 1998, a series of crises has led to distrust between India and Pakistan.[4] As a result, states have revised their doctrines to address new threats, which come with both states' focus on war-fighting capabilities that do not align with the region's nuclear stability setting.[5] In recent crises of 2019 and 2025, the pattern of crossing red

---

[2] Nicholas J. Wheeler, the Promise and Perils of 'Leaps of Trust' in India–Pakistan Relations," in *The Politics of Nuclear Weapons in South Asia* (Routledge, 2016), 155–76.

[3] Muhammad Jawad Hashmi and Sultan Mubariz Khan, *"Emerging Network Centric Warfare Capabilities of Indian Military: Challenges for Pakistan's Security,"* Margalla Papers 23, no. 2 (2019).

[4] Nicholas J. Wheeler, "Beyond Waltz's Nuclear World: More Trust May Be Better," in Realism and World Politics (Routledge, 2010), 258–76.

[5] Naveed Ahmed Malik, *"Flames across the Line: A Strategic and Tactical Analysis of the May 2025 India-Pakistan Conflict,"* Annals of Human and Social Sciences6, no. 3 (2025): 1-16.

_____

lines, international borders, and the use of drones and aerial dogfights is evident. It poses a serious and open threat to the strategic stability of South Asia.

In the third nuclear age, where significant powers like China, Russia, and the USA have inducted new emerging technologies into their arsenals. These powerful states are using these new technologies with a comprehensive gap in their regulations. In the presence of such trends and trajectories, India and Pakistan are developing and deploying emerging disruptive technologies. The Indian budget is arisen to 48 percent.[6]likewise, in the context of defence, Pakistan is advancing with new technology.

This paper aims to explore cyber insecurity and its implications for modern warfare in South Asia. Both states perceive cyber threats as a threat to critical infrastructure. In the current geopolitical environment, nuclear-powered states India and Pakistan are modernizing their cyber capabilities. The key concern this paper explores is the use of war-fighting capabilities that extend from traditional domains to non-traditional domains, such as cyberspace, which further complicates the concept of deterrence. The existing distrust needs to transition into a trust-building mechanism to smooth

_____

[6] S.S. Rana& Co. Advocates, "Union Budget 2025 Set to Boost AI, Data Security and Privacy Initiatives," Mondaq, November 19, 2025, https://www.mondaq.com/india/new-technology/1707554/union-budget-2025-set-to-boost-ai-data-security-and-privacy-initiatives.

_____

pathways for norm-building, which is further extending into more profound distrust due to the use of cyberspace in war-fighting, posing a real threat to the region. In that context, the use of grey zone and electronic warfare strategies complicates the already fragile mutual trust and deterrence framework. The paper investigates how new cyber capabilities and modern net centric warfare impact deterrence stability in South Asia and have altered traditional military operations. The study contends that without guardrails the use such tactics will destabilize the region. The study used a qualitative method and data points of the academic research are policy documents, expert interviews, and media coverage. It will be a comparative analysis of the India and Pakistan cases. The results of the study shed light on the intricate dynamics of cyber risks.[7] It should be realized that policymakers, practitioner to work on mechanisms in the face of developing technologies that can mitigate nuclear risks.[8]

To investigates how deterrence stability in South Asia is being impacted by the use of new technologies, including network-centric warfare, which is altering traditional military operations.[9] Both countries are modernizing their militaries; tensions might

---

[7]Feroz Hassan Khan, Ryan Jacobs, and Emily Burke, Nuclear Learning in South Asia: The Next Decade (2014). https://core.ac.uk/outputs/36737269/?source=2
[8]RizwanaAbbasi, "India and Pakistan: Distinct Strategic Directions and Fragility of Peace," Pakistan Horizon 68, no. 3/4 (2015): 105–30.
[9]Devin T. Hagerty and Pusca. *Nuclear Weapons and Deterrence Stability in South Asia* .Gewerbestrasse, Switzerland: Palgrave Macmillan, 2020.

unintentionally rise as a result of their lack of communication on new technologies.

Third Nuclear Age

Earlier in 1945, with the advent of nuclear weapons, the United States use nuclear weapons against japan to end their powerful role in world politics is the start of nuclear age. It was evicted how one state with its nuclear weapons.[10] Currently, the world is moved into a new nuclear era: the Third Nuclear Age.[11] The age is comprised of layers of risks and challenges. First the rise of nuclear insecurities in the presence of multipolar system, along with breakdown of Arms control Norms and suppression of nuclear ethics and rapid nuclear doctrinal shifting with expansion of nuclear arsenals and its modernization.[12]It is observe vividly how states with the possession of nuclear weapons are using tools as gears for coercion and strategic signaling rather than just deterrence. At the heart of this era is a mixture of intensifying geopolitical rivalry, rapid technological change in weapons systems, and a breakdown of the norms of global nuclear governance. (Andrew Futter, Nobel Peace Prize Forum, 2024).

---

[10] Jenny L. Naylor, "The Third Nuclear Age," Comparative Strategy 38, no. 4 (2019): 276–88.

[11] Joel PeterssonIvre, "Strategic Stability and Nuclear Salience: Japan, South Korea, and Extended Deterrence in the Third Nuclear Age" (paper, April 21, 2025).

[12] Guy B. Roberts, "Shaping the Future of Nuclear Deterrence: Adapting to New Challenges and Opportunities," Peace Review 36, no. 4 (2024): 674–91.

First Nuclear Age	Second Nuclear Age	Third Nuclear Age
The start of the nuclear age is marked by the first atomic bomb tests and their use in 1945.	1991 when Arms control setup bind rivalries and reduce the risks of threat of use of force.	Generally considered to be the current era that is the dangerous nuclear age
The Cold War standoff between the U.S. and the Soviet Union, dominated by the logic of Mutually Assured Destruction (MAD) and the threat of a large-scale, bipolar conflict.	The period following the Cold War, which was marked by a hope for disarmament (Obama 2009-2017 world without nuclear weapons) but also saw the rise of regional nuclear powers and the modernization of arsenals despite the optimism.	Shift towards Multipolar world order The norms which were set in cold and post-cold war are now undermining due to intense multipolar competition. It includes withering of norms, ethics. States are modernizing and expanding their nuclear arsenals, with China, for example, rapidly growing its stockpile.[13] The introduction of new technologies like hypersonic missiles that reduce decision-making time and increase the risk of miscalculation. Nuclear weapons are increasingly being used as tools for coercion and strategic signaling, not just as a deterrent against attack.

Unlike the Cold War period, when nuclear deterrence was relatively stable, today's security landscape is more unpredictable due to advent of emerging technologies, modernization of nuclear arsenals, cyber

[13]Pierre Vandier, Deterrence in the Third Nuclear Age, translated by Armel Dirou and Julien Lalanne de Saint Quentin (Cham: Palgrave Macmillan, 2025).

_____

threats,[14] space-based weapons, and growing tensions between major powers like the U.S., Russia, China, and at the regional level between India, and Pakistan.[15]

Cyber Capabilities in the third nuclear age

As mentioned above, in the third age with the presence of multipolar competition, loosening of arms control framework, states increasing insecurities and unpredictability due to new advance technologies the strategic dynamics have been in shifting mode.[16]In the nuclear context, cyber capabilities refer to the use of digital technologies to enhance, disrupt, or manipulate nuclear weapons systems, command and control, and deterrence strategies. These capabilities can be used by both state and non-state actors in different ways, creating new risks for strategic stability.

Cyber Espionage

The hacking issue specifically into nuclear command networks is real threat. It steals sensitive information about nuclear arsenals, launch

---

[14]Edward Geist, "Deterrence Stability in the Cyber Age," Strategic Studies Quarterly 9, no. 4 (2015): 44–61.

[15]Guy B. Roberts, "Shaping the Future of Nuclear Deterrence: Adapting to New Challenges and Opportunities," Peace Review 36, no. 4 (2024): 674–91.

[16]Kyungkook Kang and JacekKugler, "Beyond Deterrence: Uncertain Stability in the Nuclear Era," Conflict Management and Peace Science 40, no. 6 (2023): 655–74.

procedures, or security protocols.[17] In 2016, hackers linked to Russia allegedly breached U.S. nuclear power plant systems.

Sabotage of Nuclear Infrastructure

In addition, the other real threat is attacking nuclear facilities, power plants, or missile systems to cause failures or delays in nuclear

---

[17]Keir A. Lieber and Daryl G. Press, "The New Era of Counterforce: Technological Change and the Future of Nuclear Deterrence," International Security 41, no. 4 (2017): 9–49.

_____

operations.[18]The Stuxnet virus (2010) targeted Iran's nuclear program, damaging centrifuges used for uranium enrichment.

In the third nuclear age, as states upgrade their nuclear deterrence strategies, they rely more on digital systems, military applications of artificial intelligence, and networked command and control.[19]Nuclear attacks targeting nuclear plants, power plants, or missile systems are aimed at causing a breakdown or slowdown of nuclear functions. A good example is the Stuxnet virus that was directed to Iran nuclear program and caused harm to centrifuges used to enrich uranium. The utilization of new technologies is transforming the state ideas of security and nuclear deterrence.[20] Cyber threats also complicate the security situation in South Asia where both India and Pakistan are

_____

[18]Michael Krepon, "The Myth of Deterrence Stability between Nuclear-Armed Rivals," Deterrence Instability (2015): 15.

[19] Jenny L. Naylor, "The Third Nuclear Age," Comparative Strategy 38, no. 4 (2019): 276–88.

[20] Stephen J. Cimbala, "Nuclear Deterrence and Cyber Warfare: Coexistence or Competition?," Defense & Security Analysis 33, no. 3 (2017): 193–208.

equipped with nuclear weapons.[21]Cyber threats are both seen as a threat to the critical infrastructure of both India and Pakistan, such as power grids, communication networks and military infrastructures. Any cyber-attack on these infrastructures may undermine the capabilities of the defense systems of the countries and create a lack of trust between them.[22]

In modern warfare, apart from classic ways to won the war, in current age non classical war wining startgeic is adopted by states to compete. It covers their modernization and deploys all new technolgies that play a role to make to more competent in contested startgeic environment. [23] The probable opportunities that these new cyber tools are offering states are only cost effective but its real battle situation alertness.[24] As mentioned above, cyber tools will increase the efficiency, task can be done in less time with more accuracy and precisions, improve work efficient of command and control systems,

_____

[21] Andrew F. Krepinevich Jr., "The New Nuclear Age: How China's Growing Nuclear Arsenal Threatens Deterrence," Foreign Affairs 101 (2022): 92.

[22]Zenel Garcia, "Strategic Stability in the Twenty-First Century: The Challenge of the Second Nuclear Age and the Logic of Stability Interdependence," Comparative Strategy 36, no. 4 (2017): 354–

[23] Michael P. Kreuzer, "Cyberspace Is an Analogy, Not a Domain: Rethinking Domains and Layers of Warfare for the Information Age," The Strategy Bridge, July 8, 2021, https://thestrategybridge.org/the-bridge/2021/7/8/cyberspace-is-an-analogy-not-a-domain-rethinking-domains-and-layers-of-warfare-for-the-information-age

[24] Summer Iqbal Babar, Muhammad NadeemMirza, and IrfanHasnainQaisrani, "Evaluating the Nature of Cyber Warfare between Pakistan and India," Webology 18, no. 6 (November 2021).

and makes states aware of more knowledge about terrain, and views
from the sky.[25]

In addition to cyber, the amalgamation of new warfare (electronic) is
a game changer. The strategy of electronic warfare deals with how in

_____

[25] Jenny L. Naylor, "The Third Nuclear Age," Comparative Strategy 38, no. 4
(2019): 276–88.

_____

real time scenario electromagnetic system is used for awareness surveillance and reconnaissance. It works as eye in the sky for states to make rational and immediate decision.

The diagram showed how wartime's activities are interlinked and support each other. But the duo of cyber and electronics from ncuelar deterrence stability perspective is full of hazards because first it blurs lines between war and peace time. Second the interlink of different domains posed risks too. The risks can without proper offcial channels of information, any state in peace time consider it a threat and impact directly or incidentally of peace and security of region.[26]

It is United States of America like it first use nuclear bomb, adopted the war strategy.[27]US used advacend computers and well integrated command system that facilities leadership to set stratgeic choices in well informed environment. Such tactics help elite to reduce errors and make rational choices. It essentially spins around on the effective decisions making process and timey decisions to get full benefits in startgeic affairs.[28]The current age is of Information and right

_____

[26] Summer Iqbal Babar, Muhammad NadeemMirza, and IrfanHasnainQaisrani, "Evaluating the Nature of Cyber Warfare between Pakistan and India," Webology 18, no. 6 (November 2021).
[27] James S. Johnson, "China's Vision of the Future Network-Centric Battlefield: Cyber, Space and Electromagnetic Asymmetric Challenges to the United States," Comparative Strategy 37, no. 5 (2018)
[28]Thea Riebe and Christian Reuter, "Assessing Dual-Use in IT Development," Science and Technology for Peace and Security (PEASEC), TechnischeUniversität Darmstadt, March 13, 2019,

information at right time is important. Such internal military environment reduces misperceptions and full eye on enemy movements. For example in gulf war, USA used these tactics and gain startgeic objectives. The operation desert shield is very popular example of how America covers all important information and gain superiority on targets. The other example is of desert storm. It works totally opposite to previous one as it focuses on attacking strategy. It complete disrupt rivalry will and capability to fight.[29]

In the presence of multipolar competition, the south Asian region is centre of power politics and such advacend employment of new strategies is alarming. The dangers of preventive and pre-emption strikes remain overwhelm in tensed situation. It is high time in changing strategic environment, both states ought to review the pragmatic factors highlighted for regional stability. Both states should move ahead with new plans for prosperity instead of looking back in the historical bad experiences. International community, especially Americans, started pressurizing both countries to solve their disputes through peaceful means. The interests of foreign powers USA, Russia and China further accentuated the central rivalry between the nuclear neighbors of South Asia. These powers have been the dictators of regional policies in South Asia with regard to conflict and

_____

[29] Caroline Baylon, "Lessons from Stuxnet and the Realm of Cyber and Nuclear Security: Implications for Ethics in Cyber Warfare," in Ethics and Policies for Cyber Operations: A NATO CooperativeCyber Defence Centre of Excellence Initiative, 213–29 (Cham: Springer International Publishing, 2016).

_____

cooperation. The net centric warfare can be used in both offensive[30]and defensive[31] ways like USA used it in past. And while discussing its application in south Asia, in the presence of uncertainties, the system that is advacend will both states survive in future. It is a big inquiry that stressed nuclear scholars in particular and all generally.[32]These technologies have full potential of disruption. It can find gaps in nuclear security initiatives. If any state use offensive capability, others state deterrence can break and under nuclear umbrella its danger is unavoidable.

Cross-Domain Application of Weapon Systems

In the third nuclear age, it is part and parcels that how apart from traditional domains of air, sea and land, new domains are reality. It includes space, cyber. The comprehensive outlook is how states are using different domains to gain objectives. The presence of right information at right time with relevant set of data banks is new tools that make states confident to attack and rule.

---

[30]Offensive strategy is disrupting the opponent's command systems and neutralizing their ability to respond effectively.

[31]Defensive way is to use high-tech systems to monitor and protect critical assets, denying the enemy any advantage over strategic targets.

[32] Caroline Baylon, "Lessons from Stuxnet and the Realm of Cyber and Nuclear Security: Implications for Ethics in Cyber Warfare," in Ethics and Policies for Cyber Operations: A NATO Cooperative Cyber Defence Centre of Excellence Initiative, 213–29 (Cham: Springer International Publishing, 2016).

The net centric warfare is old tactics but with current advanced computing it is harnessing its tools and in the absence of legal and normative framework, the constant deployment of these tools created unlimited vulnerabilities. In last years, the technology war of Russia Ukraine, India and Pakistan and Iran Israel are examples how states are inducing it and how uncertain situation world politics listed.[33] Why states used them. The answer is obvious i) - attain supremacy, ii) - disruption iii) - Decisions making choices iv) - deploy new tools. The experts opinedit's in early stage in the third world countries but before the situation get out of control it is like a lifeline jacket to institutionalize the mechanism that not only heldarms race but also set states to initiate dialogue process. These are the new threats with new age.[34] In this stage, both states are in process to develop partnership with important states and developing startgeic partnerships that can benefits their competency.[35] It is crucial for India and pakisatn to get tech that can workable on time.[36]

_____

[33] Ayesha Abrar, "Nuclear Deterrence in the Cyber Age: Intricacies and Prospects," SJESR 7, no. 2 (2024): 1–7.

[34] Rabia Akhtar and ManpreetSethi, "Emerging Technologies and Southern Asian Nuclear Deterrence," The Washington Quarterly 47, no. 4 (2024): 99–116.

[35] High-Performance Analytics and Computing (HPAC), including supercomputers, quantum computing, and fast decision-making tools during combat for net centric warfare. Additionally, unmanned platforms for combat or surveillance will enhance situational awareness.

[36] James Johnson, "Deterrence in the Age of Artificial Intelligence & Autonomy: A Paradigm Shift in Nuclear Deterrence Theory and Practice?," Defense & Security Analysis 36, no. 4 (2020): 422–48.

In recent times, with the demand of new world order and new nuclear age, it is imperative how much time and investment India and Pakistan will exercise to achieve that technical level of net centric warfare. It is clear there are more weak grey areas that inculcate security dilemma. In the presence of such contested environment, where nuclear deterrence is the way to keep rivalries to lock their horns, such cyber vulnerabilities are prospective hazards. It leans towards misperceptions and miscommunication. The other important issue that is linked to cyber warafre is of anonymous nature of attackers. It further accentuated misperceptions and dangers in warafre.[37]

Weakened cybersecurity in the form of vulnerabilities could undermine the trust of India and Pakistan in each other in his or her defensive postures, and this would negate perceptions of state security. This kind of erosion may instigate mistakes and increase the likelihood of war. The two nations rely on nuclear deterrence as a system to prevent war, in theory, a nuclear retaliation by the opponent

---

[37] James Johnson, "The AI-Cyber Nexus: Implications for Military Escalation, Deterrence and Strategic Stability," Journal of Cyber Policy 4, no. 3 (2019): 442–60.

_____

would deter the first aggressor hence halting hostilities. However, the cyber vulnerabilities of both countries of India and Pakistan to the national infrastructures create uncertainty, which may intensify accidental incidents that may lead to armed confrontation even when there is a nuclear deterrent. Another contextual issue that comes to mind in any conflict scenario is the attribution of cyber-attacks. Although attribution is not an easy task in the time of peace, the task of diplomatic and military reaction becomes more difficult when the war is running. This uncertainty encourages misinterpretation, where one party can get the other party wrong and hence the development of escalation or unwanted animosity, especially when the two governments use cyber capacity as an integral part of their military doctrine. Large-scale use of high-technology cyber-activity by India and Pakistan is more likely to create inadvertent operations and wrong communicating.

Therefore, the question is whether it is wise to be dependent on cyber-capabilities. It can be tedious to decide that an attack has fully compromised a system or just compromised a number of functions.[38] False sense of security might also be maintained when there are signs of strength in cases of breaches.[39] When one state does not know that its systems are compromised, and misjudges the context as an external attack, it may respond to the situation with an inadequate aggression, and the accidental conflict will occur.[40]

On the other hand, when both states deal with cyber vulnerabilities on a long-term basis, it can be assumed that they will achieve higher resilience and safety in the long run.[41] On one side, India with her stratgeic objectives is highly investing on its force posture that deals with new nuclear technology. India developed its missile defense program mainly in collaboration with Israel and Russia due to technological and economic restraints. USA now supports India to have an anti-missile shield and modernize its nuclear arsenals. USA

---

[38] Muhammad Fahim Khan, AamerRaza, and Noreen Naseer, "Cyber Security and Challenges Faced by Pakistan," Pakistan Journal of International Affairs 4, no. 4 (2021): 865–81.

[39] Sidra Shabbir, Hani Fatima, Sundas Malik, AsgharUllah Khan, and Min Zheng, "Cyber Warfare from Pakistan-India: A Critical Analysis," International Journal of Special Education 37, no. 3 (2022): 2452–58.

[40] David C. Gompert and Martin Libicki, "Cyber War and Nuclear Peace," Survival 61, no. 4 (2019): 45–62.

[41] Daniel H. Wang, Death of a Doctrine: The End of Classical Deterrence in a Complex Multipolar World (2025).

strategic objectives in case of BMDs are to allow India access to superior technology and intelligence systems. [42]

In the cyber security context, India all public private companies and stakeholders are on same page.[43] India is advancing but it is still question are these are responsble innovation and how endlessly it is impacting nuclear deterrence equilibrium.[44] In 2025 nuclear it is open secret how India comes up with all new net centric war fighting capabilities. With aim to target pakisatn cyber sectors but in reality the situation goes in pakisatn favors and apart from India high advance capabilities they fail to complete pakisatn in man power quality and revealed there are wide gap their capabilities. But the argument is India is consistory learning and advancing and without guardrails in near future in with such military equipment's hazards becomes more reality.[45]India with her 'Make in India" project needs to induce nuclear responsible mechanisms.

[42] Patrick Cirenza, An Evaluation of the Analogy between Nuclear and Cyber Deterrence (PhD diss., Center for International Security and Cooperation [CISAC], Stanford University, 2015).

[43] Manuel Fischer, "The Concept of Deterrence and Its Applicability in the Cyber Domain," Connections 18, no. 1/2 (2019): 69–92.

[44]Haris Bilal Malik, "Pakistan's Quid Pro Quo Plus: A Key Strategic Determinant," STRAFASIA Strategic Foresight for Asia, Apr. 13, 2020,
https://strafasia.com/pakistans-quid-pro-quo-plus-a-key-strategic-determinant/.

[45]Summar Iqbal Babar, and Abu Hurrairah Abbasi. "Emerging technologies and the threat to South Asian security." CISS Insight Journal 11, no. 2 (2023): 40-59.

_____

Lack of Communication and Engagement

In current strategic situation, India and Pakistan both have their threat
perception towards others. Pakistan perspective is it was due to Indian
aggressive policy since its inception, so Pakistan found its "First Use
Policy" as a prudent option to craft a viable deterrence vis-a-vis to
Indian conventional forces.[46]Consequently, to overcome security
concerns, Pakistan maintained defensive policy to counter these
threats. India has security reservations from China as well. A growing
China, which might propel in the favour of Pakistan given its
unstinted ties with Islamabad, was another fear that gripped New
Delhi to pursue the far sighted defense policies with newly inducted
and refurbished political and military doctrines.

 If both states work to open channels and all about possible scenarios
that are perilous for regional stability then it is only viable approach
of nuclear responsible states.[47]The last decade nuclear crises revealed
that how with the lack of official channels before, during and even
after the crises situation turned towards uncontrollable as well.[48]Dr.

---

[46]Waseem, Rubina, and Muhammad Sajjad, "Conceptualizing new avenues of the
Indo-Pak hostilities: an analysis of the invisible PsyWar operations and challenges."
Liberal Arts and Social Sciences International Journal (LASSIJ) 6, no. 2 (2022):
161-174.
[47]Rajeswari Pillai Rajagopalan, "The Many Unanswered Questions About India's
Missile Accident," The Diplomat, March 18, 2022,
https://thediplomat.com/2022/03/the-many-unanswered-questions-about-indias-missile-accident/
[48] Muhammad SharehQazi, "Between 'Cyber Insecurity' and Modern Warfare: The
Precarious Tightrope of Deterrence Stability in South Asia," Stimson Center, June

Rabia Akther, Dr. Zafar Jaspal and Dr. Naeem Salik, Pakistan's nuclear experts on strategic issues viewed that the element of ambiguity and lack of transparency remains eminent in nuclear crises and become a source of worries for entire peace initiatives community. The way forward is dialogue and with the strong political will. It includes all level of dialogue process which covers, not only issues but also weapons development and deployment procedures. The crises demonstrate how mutual mistrust; domestic instable factors and intervention of non-states actors make situation that run a high risk of spiraling out of control. There are many other assessments that neither India nor Pakistan seemed able or willing to defuse the situation due to their domestic constraints and interstate conflicts.[49]

According to deterrence optimists, in non-weaponized and nuclearized era, nuclear weapons play their dynamic role but in the third nuclear age are important to manage and learn right nuclear lessons to manage low intensity crises that induce instability and in future it can be.

In addition, the media in India is being reckless and jingoistic. It is expected to hold on to the fundamental ethics of journalism. They negatively highlighted the issues as of Pak-India conflicts that can

_____

27, 2024, https://www.stimson.org/2024/between-cyber-insecurity-and-modern-warfare-the-precarious-tightrope-of-deterrence-stability-in-south-asia/

[49]Akash Shah, "Deterrence under Surveillance: Indian Space-based ISR Capabilities and Pakistan's Nuclear Deterrence," Journal of Security & Strategic Analyses 8, no. 2 (2022): 7–26.

_____

threaten the security parameters. This situation has not only rolled back the peace process but also shows how fragile the process itself is. Until and unless both countries don't solve the core issues the clouds of nuclear conflict will keep hovering over India and pakisatn.

The conflict over the Kashmir dispute is the major dynamic of instability that could cause a nuclear exchange. Kashmir often referred as a possible nuclear flashpoint. South Asia faced a variety of internal (terrorism) and external problems, it is very crucial to understand how these issues should be resolved for stability. The crisis erupted in South Asia are of high tensions and without early warnings. It raises the danger that these can escalate to nuclear war. It depends upon the nature of the leadership of that at time of war i.e. political military, how decision makers will handle the situation. As it is widely believed that comparatively political leadership remains rational while military leadership has an aggressive attitude during crisis. Particularly in case of Pakistan and India, a nuclear reaction would be directly proportional to the adversary's reaction that how far adversary has come to challenge the perceived threshold of the opponent in the conventional conflict.

Framework to Prevent Escalation- A framework that facilitate South Asian region to maintain and prevent a major nuclear war in future can hold on the solid foundation of the resolution of Kashmir with the will of Kashmiris. With the presence of key issues, the elements of

fragility will remain and the way forward is to work on a framework that can replace blame game with the nuclear responsble behavior keeping in view the overall security situation of regional and at broad at world level.

Strategic Restraint and Past Incidents

In the aftermath of Cuban missiles crisis of 1962,USA and USSR avoided inadvertent nuclear war with the strategic support of arms control bilateral agreements.[50] The phase is the testimony that how successfully Washington and Moscow negotiated numerous bilateral and multilateral treaties for the sake of nuclear stability. Unquestionably, the long and difficult process of negotiating arms control measures constituted of the nuclear restraint regime between USSR and USA.[51] Resultantly the nuclear restraint regime improved due to channels of communications between the adversaries which reduced uncertainty and entailed strategic stability in the region.[52]

---

[50]Arzan Tarapore, "Conditional Restraint: Why the India-Pakistan Kargil War Is Not a Case of Nuclear Deterrence," Bulletin of the Atomic Scientists 79, no. 6 (2023): 388–392.

[51]Hasnain Haider, Allah Ditta, Attya Firdous, Bedar Bakht Khan, and Malik BakhtawarMumtaz, "Missile Politics and Strategic Hypocrisy: Pakistan's Deterrence Doctrine Amid US–India Strategic Convergence in South Asia," Research Journal for Social Affairs 3, no. 4 (2025): 351–364.

[52] Saba Kiran, "Strategic Culture of India and Pakistan and Its Implications for Strategic Stability," NUST Journal of International Peace & Stability (2024): 51–63.

For a peaceful environment, it is believed that following effective diplomacy the agreements signed between India and Pakistan can avoid nuclear exchange and canimplemented swiftly to maintain peace and stability in critical situations. For scholarly discussion one can categorize the main agreement between Indian and Pakistan. There are some agreements which are already working and some still in process to be implemented. The main problem is that already signed agreements should be workable at the time of crisis to fulfill its objective. India and Pakistan are modernizing their force arsenals to make them stronger. Defence expenditures have increased significantly. These are the factors which can alter the deterrence stability between both adversaries. Conventional arms control agreements can restraint the arms build up to make South Asian peaceful.

Whenever states conduct exercises it make the impression by the Military Intelligence that opponent would be making their nuclear capabilities operational. For example, Poorna Vijay (complete victory) exercises by India in 2001. It can prove fatal for the regional environment if such nuclear exercises were misperceived by the both nuclear states. However, both the states lack the technologies to develop such technical equipment.

In the presence of emerging threats and challenges, the accidental, misperceptions, miscalculation or unauthorized use of nuclear bombs

has increased. In addition these weapons are vulnerable to loss and
theft, so certain actions are needed to reduce these dangers in the
conflicting region. The important measures for nuclear risk reduction
is to resolve the Kashmir issue, it will have to come from options that
preclude a military solution.[53]To preserve the nuclear peace in
addition to nuclear security, each states effort to respect each other's
sovereignty and territorial integrity e.g. issues like Kashmir issue,
Saichen glacier, Kargil, cross border terrorism.[54]

Both nuclear armed states should improve the command and control
arrangement with the assistance of developed countries. The hazards
have move beyond and in the third nuclear age these cyber tech is
adding layer to the existing issues.[55]Both leaders should focus on how
to deal with short flight time and how to set time to warn each other
during before and after the nuclear crises.[56]India and Pakistan
institutions and mechanism ability and timely response are vital to
manage nuclear risks. From expert's opinions, it is infer that the

---

[53] Kamal Matinuddin, The Nuclearization of South Asia (Karachi: Oxford University Press, 2002).
[54] Maryam Azam, "Pakistan–India Security Paradox: Between Deterrence and Coercive Diplomacy," Journal of Security & Strategic Analyses 7, no. 1 (2021): 160–80.
[55]Muhammad Saeed Khan, Fauzia Ghani, Farzad Ahmad Cheema, Gulshan Majeed, and Khizar Hayat. "Pakistan's Foreign Policy towards India: Exploring Diplomatic Engagement and Strategic Challenges (2000–2025)." Journal of Regional Studies Review 4, no. 1 (2025): 347-360.
[56]Maryyum Masood and Muhammad Ali Baig, "Potential Impact of Lethal Autonomous Weapon Systems on Strategic Stability and Nuclear Deterrence in South Asia," Margalla Papers 27, no. 2 (2023).

warning time should be increased from 3-11 minutes for reasonable interval to diffuse the disastrous situation through constructive dialogue.[57]The transparency mechanism and established trained units to deal with the nuclear smuggling are considerable measures to save the region from nuclear threat. For transparency mechanism both sides should maintain data about nuclear weapons which includes nuclear weapons storage sites and facilities, military stacks of fissile materials.[58] The regional verification regime is the important component for the stability regime; however it is not easily verifiable. States can infuriate the nuclear redline for the sake of their national interests and dominance. Sovereign states don't accept intrusive inspections. A great deal of trust and confidence is necessary.

Deterrence Stability is not a static phenomenon. It can shift its balance in either competitor's favor even with a single minute strategic move. As long as a nation possesses the ability to inflict un–acceptable damage on an aggressor, deterrence stability will exist irrespective of nuclear and conventional and unconventional arsenals of the countries concerned. The deterrence stability maintained peace in nuclear environment and it in past regulate nuclear war pressure, state

---

[57] Adeela Ahmed, "The Contours of Pakistan's Relations with Russia," in Pakistan's Foreign Policy, 181–92 (Routledge, 2022) *see also* Robina Khan, Umme Laila Israr Rasool, Abdul Waheed, and Ghulam Mustafa, "Deterrence Stability in Nuclear South Asia: Issues and Complexities," Journal of Positive School Psychology 7, no. 3 (2023): 443–58, http://journalppw.com

[58]Rizwana Abbasi and Muhammad Saeed Uzzaman, Changing Patterns of Warfare between India and Pakistan: Navigating the Impact of New and Disruptive Technologies (Routledge, 2023).

IJKS: Vol 7 No. 01/2025

Adeela Ahmed: **The New Emerging Technology Cyber Capabilities:** Prospective Hazards on Deterrence Stability between India and Pakistan
_____

crisis, and asymmetric economic development within the region. Deterrence pessimist's views should be acknowledged by rational decisions makers to fill the gap and ensure deterrence stability. It is clear from above discussion that India and Pakistan are in their preliminary phase of technological innovation. The threat to cross redlines inadvertently is there due to lack of robust tech. governance system. Credible deterrence is required to prevent adversaries from crossing the nuclear threshold. The role of political, military and strategic scholars is important to curtail the factors of instability. Deterrence stability requires sustained efforts to make it more robust. Since we are witnessing the new strategic environment, nuclear CBMs are crucial for trust building and mutual gain for this conflict prone region. It enhances the chance to prevent nuclear disasters.[59] It can be achieved by resolving the issues through dialogues instead of arms race

Political and Military leaderships should be rational in their approach at interstate level and should avoid aggressive policy of using force.[60] The power politics in the political and military level undermine stability situation. It demands a reciprocal step by the adversary,

_____

[59] Abdul Rehman, "Kashmir as the Disputed Legacy and Flash Point in Nuclear South Asia," Journal of Politics and International Studies 8, no. 1 (2022): 1–16.

[60] Muhammad Sadiq and Iftikhar Ali, "Challenges of Nuclear Deterrence Stability in South Asia," Journal of Asian and African Studies 58, no. 8 (2023): 1511–27.

_____

which will turn the deterrence stability to the minimum.[61] This was the case in the nuclear Brass-tacks exercise by India in 1985/86. During this India deployed its exercise in Rajasthan without informing Pakistan thereby threatening the prevalent stability equation.

These focused on resolution of all disputes through peaceful settlement. Unfortunately, not even any bilateral agreements, composite dialogue any co-operative arrangements proved to decrease any tensions.

The necessity is to tackle the lingering concern of crisis prevention and institutionalize measures that would improve the stability of nuclear establishment on both sides, the antagonistic powers.[62]The role of CBMs should be encouraged, which is the best policy for stability in an environment saturated with prevalent mistrust, especially at critical time of tension. Diplomacy at the highest level must be given a fair chance to diffuse imminent crisis. Official communication channels must remain open. The role of international

---

[61]MasoomaZehra and Syed WasimUddin, "The Nuclear Evolution of Pakistan & India: A Historical Overview," Pakistan Journal of International Affairs 5, no. 2 (2022).

[62] Adeela Ahmed and Arsim Tariq, "Demographic Changes in Indian Occupied Jammu and Kashmir and the UN Resolutions," International Journal of Kashmir Studies 3, no. 2 (2022).

community is very important to encourage the both sides to maintain relation for the stability in the region.[63]

Nuclear war causes catastrophic results, given the preponderant idea of MAD, but efforts should be directed and energies spent to make certain measures to avoid that disastrous option.[64] Nuclear risk reduction and strategic restraint regime, a sine-quo-non for the survival of both states, can play a viable role for stability in the region. India and Pakistan should doggedly resolve core disputes through efficient diplomats and politicians (parliament), civil society (Track II and III diplomacy) and various media organizations.[65] The exigency is to realize the necessity of peace in the region wallowing in steep poverty and marked by internecine strife and conflicts of different varieties.[66] The scourge of terrorism with transnational links has created new exigency for both states to earnestly work for peace and stability.[67] The peace process should be organically linked with interdependence; otherwise Mumbai carnages of different varieties,

---

[63]Piotr Balcerowicz and Agnieszka Kuszewska, Kashmir in India and Pakistan Policies (Routledge, 2022).

[64] Adeela Azam, "Indian Foreign Policy towards Pakistan during Modi Era: Assessing the Role of Ideology–Hindu Nationalism," BTTN Journal 1, no. 1 (2022): 17–35.

[65]Garima Das, India-Pakistan Rivalry in May 2025, Conflict, Proxy Warfare, and Geo-Political Alignments (May 10, 2025).

[66]Chunhao Lou, "Geopolitical 'Entanglements' and the China-India-Pakistan Nuclear Trilemma," Journal for Peace and Nuclear Disarmament 5, no. 2 (2022): 281–95.

[67]Izzat Raazia and Saqib Ur Rehman, "Kashmir Conflict and the Question of Self-Determination," Journal of Development and Social Sciences 2, no. 4 (2021): 111–19.

in future, will hijack what the little would have achieved. The efficacy of risk reduction measures and containment of WMD should be acknowledged.[68] It will be applicable through co-operation in certain areas between nuclear adversaries.

The official reports of established think tanks SIPRI, UNIDIR, and Military balance revealed that how both nuclear powered states are consistently evolving their doctrines, force posture in the current age.[69]The constant modernization along with adventurous operationalization like in the 2019 Pulwama-Balakot episode and the BrahMos missile launch by India in 2023 revealed that in past it is noticed that a factor of restraint exists.[70]But it is not a guarantee that without mechanisms will it work in future or not. It is high time to think responsibly and open forum that work and facilitate dialogue. It is the only way forward towards regional nuclear stability.

---

[68] Kamal Matinuddin, The Nuclearization of South Asia (Karachi: Oxford University Press, 2002).

[69] Antoine Levesques, "India's Fraying Restraint," Survival 66, no. 2 (2024): 63–71.

[70]Rajeswari Pillai Rajagopalan, "The Many Unanswered Questions About India's Missile Accident," The Diplomat, March 18, 2022, https://thediploma t.com/2022/03/the- many-unanswered-questions-about-indias-missile-accident/ see also Azhar Shahbaz Khan and Ahmad Hassan Awan, "Deterrence; Theory and Practice in Changing South Asian Strategic Stability," Journal of Security & Strategic Analyses 7, no. 2 (2021): 91–112.

_____

Conclusion

India and Pakistan, the two nuclear weapon state who are engraved with deep enmity and the short term solution seems impossible due to India startgeic thought that we analyze how they are constantly increasing their capabilities with full pace. Ideally it is crucial for the humanitarian concern of the whole region; it is imperative for states behave responsibly and work to focus on how to manage nuclear risks. The possible paths keeping in the context of India and Pakistan nuclear relation the lack of effective ways hotlines on crucial issues like Kashmir, misperceptions erupted due to extensive use of new tech in the absence of legal frameworks on new nuclear technology is prospective hazards.

The timely initiative with the urgency to institutionalize such mechanisms is stratgeic lifeline before any low-cost vested interest comes into play to disrupt the fragile deterrence stability and uncertain attempts made by both sides. As India wants to project itself a global power, it should realize that in modern time's power and influence spring out of economic strength. In essence, there is need for stratgeic dialogue, transparency at different level of innovation in military actions, and setting clear ethical and normative standards in the modern warafre, such crucial steps can navigate the paths foe accidental nuclear risks and can bridge trust processing trend between India and Pakistan.