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Understanding Pathways to Nuclear Escalation in Southern Asia

Edited by
Manpreet Sethi

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Centre for Air Power Studies
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To

All those trying to plug pathways to nuclear escalation....

More power to your ideas and actions

This monograph has been published in collaboration with Prof Matthew Bunn of the Belfer Centre for Science and International Affairs, Harvard Kennedy School, as part of the Research Network on Rethinking Nuclear Deterrence funded by John D. and Catherine T. MacArthur Foundation.

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Introduction

Manpreet Sethi

In June 2022, Professor Matthew Bunn of the Belfer Center for Science and International Affairs, Harvard Kennedy School, and I embarked on a journey of co-chairing a working group, one of the four that was set up as part of the Research Network on Rethinking Nuclear Deterrence, funded by the MacArthur Foundation. As part of this exercise, we took upon ourselves the task of identifying possible pathways to nuclear war, examining their degree of probability, and finding ways of plugging the gaps to minimise the chances of deterrence breakdown. Along with other experts from around the world, we explored these issues in the context of the nuclear relations between the USA and Russia, the USA and China, and the dyads involved in Northeast and Southern Asia. We found, not surprisingly, that each of the dyads had some common and some unique pathways and factors that could possibly lead to escalation up the nuclear path.

This monograph emerged from the discussions at a webinar we organised in 2023 to examine the plausible nuclear escalation pathways in the two adversarial nuclear dyads in Southern Asia. As is well known, three nuclear-armed states sit geographically next to each other in this region. India sits in the middle and has troubled relations with both Pakistan and China, nuclear-armed neighbours on either side. Territorial disputes and unsettled national borders lend themselves to allegations and counter-allegations of transgressions and skirmishes. Further potential for crisis is created by the not-so-infrequent cross-border terrorism by organisations supported by the Pakistani state. In recent times, Pakistan too has alleged that India has supported terrorist activities against

Pakistan. Every time a crisis between India and Pakistan breaks out, loud nuclear noises emanate from Islamabad. They resonate across the world and many express anxiety over the possibility of the region collapsing into a nuclear conflagration. It may be recalled that Bill Clinton, the president of the USA in 1998 when India and Pakistan conducted their nuclear tests, had described the region as a nuclear flashpoint. Since then, this name tag has been evoked often, although looking at the global scenario today, Southern Asia appears to be *only one* of the regions that qualifies as a hotspot.

Indeed, the contemporary nuclear landscape is dotted by several worrying features: hot wars with nuclear overtones in the Middle East and between Russia and Ukraine; the existence of multiple nuclear dyads (some elongating into strategic chains, creating trans-regional nuclear tensions); increasingly hostile relations among major nuclear-armed states; evolving technologies that may increase nuclear risks; ongoing nuclear modernisation that reflects continuing or increasing reliance on nuclear weapons in nuclear-armed states; unresolved territorial and security disputes among nuclear-armed states; doctrines that suggest increased reliance on nuclear weapons; states that seem to believe that creating nuclear risks is useful for achieving their deterrence or foreign policy objectives; and a generally increased propensity for the use of force – despite, or because of, the presence of nuclear weapons. Each one of these conditions, individually or collectively, could create pathways to nuclear war.

Efforts need to continue to be made to avoid *any* nuclear use, and not let the 80-year tradition of non-use of nuclear weapons be eroded. If that were to happen, it could result in "normalising" the use of nuclear weapons in the future. Each step that states take to reduce the risk of nuclear use, increases the chance that the world will be able to avoid a nuclear war until the time nuclear weapons can be eliminated.

Ultimately, nuclear disarmament might put an end to these nuclear dangers. But since that ultimate solution is not yet visible on the horizon,

it becomes imperative for the sake of security until then, to evaluate states' nuclear deterrence doctrines, postures, strategies, language, and behaviour, for how they are enhancing or reducing nuclear risks. At the same time, it would be useful to also assess efforts at nuclear diplomacy, such as through negotiations to arrive at confidence-building measures or arms control, or resolve disputes, for their contribution to blocking pathways to nuclear disasters.

The Discussion on Pathways to Nuclear War

This monograph contains papers of scholars and former practitioners from India and Pakistan. Professor Bunn and I tried several times to reach out to Chinese experts, but we failed to secure any writings from them. Consequently, the India–China nuclear dyad remains under-explored in this publication. However, we do include an article by an American scholar to bring in the perspective of *that* third party, which has often played a critical role in South Asian crises. Overall, the writings reflect gender and age diversity and a high level of topic expertise and academic and professional experience.

The authors were tasked to provide their individual sense of what could be the most dangerous pathway by which a nuclear war might start, and how it might vary from one set of potential nuclear adversaries to another. Nine possible pathways were initially offered for examination. These included:

- Nuclear use to stop a feared conventional defeat.
- Nuclear use to achieve a military breakthrough.
- Nuclear use when nuclear weapons in the field are threatened with destruction or seizure.
- Nuclear use based on the belief that nuclear war is inevitable and pre-emption could provide an advantage compared to not doing so.
- Nuclear use due to a false alarm or nuclear accident.
- Nuclear use due to miscalculation of the other's intention to launch.
- Nuclear use due to terrorist action in the midst of a crisis.

- Nuclear use as a last act of revenge if one's own side is being destroyed.
- Nuclear use due to any domestic reason/compulsion (civil-military friction; personality of leadership; religious factors).

For this monograph, we suggested that the experts use this list to identify or discuss pathways that they saw as particularly plausible, or add new pathways as they thought fit. They were also asked to examine factors that they felt might be critical in increasing or decreasing the risk of nuclear conflict, such as characteristics of nuclear forces and policies (alert levels, dual-use systems, doctrines on when and how nuclear weapons would be used, etc.), evolving technologies that might affect strategic balances and the risk of nuclear conflict, and changing global geopolitics. It was also recommended that the authors offer suggestions on what the nuclear armed countries could do along each of the pathways they identified as especially dangerous to reduce these risks in Southern Asia.

Interesting congruences and divergences can be found in the five papers. All authors agree that the risk of nuclear use would be the highest in the event of an intense crisis or conflict rather than from scenarios involving a "bolt from the blue" type of attack. Also rated low are chances of nuclear use through unauthorised decisions or false alarms. Perhaps, the fact that the arsenals of the three countries have traditionally not been maintained at postures of high hair-trigger readiness is one reason for this.

Interestingly, most authors have also downplayed the overall probability of *any* nuclear use in the region, though they provide diverse reasons for this. Explanations offered include a commonality of the general approach taken by regional states that considers nuclear weapons as political instruments for deterrence rather than military tools of war-fighting; a widespread perception that the leaders have an understanding of the dangers of nuclear use, especially owing to the physical proximity of the countries and their densities of populations; and a sense of restraint

that could be partially attributed to a consciousness of the norm of non-use.

Also, between the two dyads of India-Pakistan and India-China, relative instability is perceived to be higher in the former owing to a few reasons. The most pertinent cause for this is the continued occurrence of cross-border terror attacks. These are seen as a major trigger for crises that would inevitably carry the seeds of escalation risks. In the case of India–China, while territorial disputes do create room for crisis, the fact that these skirmishes take place in relatively unpopulated heights, makes them less central to domestic politics on either side of the dyad as compared to terror attacks that physically and psychologically directly affect the populace. Therefore, it is a common view that India-China disputes have less likelihood of becoming *casus belli*, especially of the kind that could lead up to a war big enough to conceivably justify nuclear use. Similarities in the nuclear doctrines of the two countries and their basic understanding of the role of nuclear weapons are also factors that reduce the likelihood of a nuclear war between the two.

One possible pathway that more than one author has flagged is the possibility of nuclear use due to inadvertence, a situation which neither side wanted, but in which they ended up due to miscommunication within their own chain of command or due to misperception of the other's intentions. Some may argue that such use could still be described as deliberate because someone will have to take the ultimate decision to use a nuclear weapon. That is true; but even then, the act of pushing the nuclear button would have arisen through an unexpected series of events and not through a deliberate plan. Unplanned developments or circumstances exacerbated by a state of panic or the fog of war or misreading of intentions could lead to nuclear use. When nations deliberately maintain risky postures, such as delegating command of Tactical Nuclear Weapons (TNWs) to front-line commanders or co-locating or co-commanding nuclear and conventional forces, the possibilities of inadvertent escalation naturally increase.

Development of new and evolving technologies such as cyber weapons (which can blur the lines between peace and war and offer few agreed escalation thresholds), long-range precision conventional weapons (which can carry out some strategic missions without nuclear use), Artificial Intelligence (AI) and autonomous weapons (which may heighten the speed of battle and bring in poorly understood biases and problems), missile defences (which can complicate strategic balances and tempt pre-emption premised on a false confidence in being able to protect oneself against retaliation), hypersonic weapons (which complicate defence and leave the ultimate target unknown until the last moments) are all likely to seriously impact nuclear deterrence in ways that are not adequately understood yet. The purpose of all these capabilities is to enhance nuclear deterrence or conventional war-fighting capabilities. For instance, dual-use capabilities are meant to complicate the adversary's decision-making; hypersonic missiles are meant to signal an ability to defeat missile defences; the use of AI is meant to accelerate and strengthen decision-making. But, the downside of these technologies will be to raise instability during crisis situations when each adversary is bound to believe the worst and act accordingly. This could take nations towards nuclear collision on pathways paved with misperceptions and miscalculations.

Some Other Possibilities….

Besides the likely ways thoughtfully deliberated upon by the authors, there are at least three other possibilities that deserve a mention. The first of these could arise from a "use them or lose them" incentive—a fear of losing one's own nuclear retaliatory capability to an adversary's ability to disrupt essential support in domains such as space or cyber. Such a disturbance, or even the risk that one's command and control could be compromised, could heighten a sense that one's own assured retaliation capability was vulnerable – which could tempt states to use their forces before they lost the chance to do so.

A second pathway could stem from a belief that a limited nuclear war could be fought and won. One side might believe it could accomplish vital objectives by using a limited number of low-yield warheads, in a limited geographical space – and then use its remaining nuclear weapons to deter its adversary from a devastating counter-attack. Planners in some states appear to perceive such an approach as a viable format for a containable or controllable nuclear war. This idea is further fortified when such nuclear use is presented as morally and legally defensible. In this case, nuclear war-fighting envisions logical and controlled nuclear operations based on a confidence of being able to manage escalation with a pre-conceived, limited attack. Such thinking and plans can seduce leaders toward the use of nuclear weapons. But, war-game after war-game has shown the difficulties in containing nuclear wars, even if they started with calibrated use to run along pre-determined pathways. The truth is that no one knows what turn a war could take after the first mushroom cloud goes up.

A third path to nuclear use could arise from the manner in which organisations or militaries within a nation think about the role and treatment of nuclear weapons and train for them. Nations that support a more war-fighting view of the weapon, and train through exercises that envisage the use of the weapon to achieve military objectives, can be expected to be more pre-disposed to the idea of its use in a crisis, compared to nations that believe that these are only political weapons, useful only for deterring others from using them. In this context, Pakistan and India stand at two ends of the spectrum. While Pakistan argues that there is a seamless continuum from conventional to nuclear escalation, India sees these as two different planes. Indian military forces are not known to have practised the use of nuclear weapons in exercises, since these are not seen as war-fighting weapons. There is a clear articulation of this in the Indian nuclear doctrine which upholds that nuclear weapons are for deterrence by punishment. Not surprisingly, India deters through the idea of massive retaliation, signalling that there is only one rung of

escalation at the nuclear level. It is also for this reason that India dismisses the concept of tactical nuclear weapons and argues that every use of the nuclear weapon, irrespective of its yield, target, or extent of damage, would have a strategic impact. So, differences in how nations think of nuclear weapons could also have an impact on creating or blocking pathways to nuclear escalation.

Risk Mitigation Strategies to Plug Pathways to Nuclear Use

As is evident, then, belief systems, methods of practising deterrence, nuclear force postures, perceptions of technological strengths of the adversary compared to one's own vulnerabilities and vice versa, and the manner in which militaries/nations have been trained to think about nuclear weapons can create pathways to nuclear use once a crisis has erupted. The best mitigation measure, of course, would be the resolution of issues that cause crises in the first place. But, until such time as the ideal situation can be reached, it is critical to manage conflict in a manner to minimise escalation possibilities during crises.

The year 1945 was the last time nuclear weapons were used. Since then, national nuclear arsenals have touched peaks of tens of thousands, nuclear possessor nations have fought direct and proxy wars, professed first-use doctrines, accepted defeat in conflicts with non-nuclear states – all without resorting to the use of nuclear weapons. Why is that so? While each crisis has its own unique tale to tell on why it was able to get off the escalation ramp, one common conclusion that can be reached from the eight decades of non-use of nuclear weapons is that such use is not as easy as it is often made out to be, even by countries that follow brinkmanship strategies and brandish these weapons, such as Pakistan or today's Russia. The former projects an inability to fight a conventional war with India and, hence, seeks to project an inevitability of nuclear use, including of TNWs. Similarly, Russia too has undertaken nuclear sabre-rattling that began with its invasion of Ukraine. But, despite Western concerns that Russia will run out of options after each major setback, Russia has not

used nuclear weapons. While the last word on how this story ends is yet to be written, it does underscore the fact that the barriers to actual military use of nuclear weapons, even of a few TNWs, are high. This is even more true in Southern Asia, where each of the contending actors is geographically proximate enough not to be able to escape radioactive fallout if the weapons were to be used close to the borders. Also, each one of them today has a robust second-strike nuclear capability that is capable of mounting assured retaliation, a fact that highlights mutual vulnerability.

It is for this reason that some analysts and practitioners have argued that an effective nuclear deterrent policy and posture is the most important nuclear risk-reduction measure. They argue in favour of ensuring that a country's nuclear deterrent is sufficiently capable to signal credible deterrence through the threat of assured retaliation. But, the danger in this line of thinking comes from the fact that what may be considered effective deterrent forces and postures by one could be seen as threatening and provocative by the other, leading both into arms racing and creation of security dilemmas that could potentially open other pathways to nuclear use.

Therefore, nuclear deterrence must be complemented with other measures to keep the nuclear peace. The authors featured in this monograph have suggested a range of ideas to reduce the risk of nuclear war. One measure that resonates amongst all is the need for strategic dialogues to address misperceptions and misgivings about the other's capabilities and doctrine, as well as the importance of effective mechanisms for communications during crises. These could include agreements on prevention of incidents getting out of hand, hotlines at appropriate levels, military-to-military communications, and even back-channels for high-level exchange of views.

Global geopolitics has implications for individual regions as well. Unfortunately, in the contemporary times of severely stressed relations in every nuclear dyad in Southern Asia and many of those in the rest of the

world, there is little near-term prospect for putting robust risk-mitigation measures in place. Nations are tending to lean towards strategies that create risks since these are seen to enhance deterrence. But, it is worth stockpiling ideas for reducing nuclear dangers, however difficult their acceptance seems in the current context, so that they will be available to policy-makers when nations are ready to accept them.

Let me add to the recommendations offered by the authors of this monograph. These suggestions may appear a bit far-fetched in today's landscape, but they would make sense if the nuclear tide turns. In any case, plentiful ideas need to be on the table when the nations begin to look for alternatives to today's business as usual. The menu of options should then be many and varied. Who knows when the time of an idea may come!

One idea could be to formally renounce hair-trigger postures such as launch on warning or launch under attack. Modifying characteristics of nuclear postures, such as whether nuclear weapons are ready for launch at a moment's notice, or whether the authority to use nuclear weapons is centralised at all times, would provide reassurance to the other side, reducing its "use them or lose them" pressures. In fact, with commingling of nuclear and conventional delivery systems, there could be a tendency to lean towards waiting to know the nature of the attack before launching on warning, which otherwise could lead to escalating to the nuclear level even if the incoming missiles were conventional. Therefore, since deterrence is a function of certainty of retaliation, not its speed, agreements on lowering alert levels could be a way of plugging another pathway to nuclear war.

Secondly, acceptance of No First Use (NFU) could be a viable risk reduction measure too. NFU offers a viable combination of reassurance and deterrence, besides addressing crisis and arms race instability issues. A credible first strike demands a pretty *demanding* slew of capabilities -- a large arsenal of accurate missiles, Multiple Independently Targetable Reentry Vehicle (MIRVed) missiles to carry out multiple hits, elaborate command and control to enable simultaneous attacks, and highly capable

active and passive defences to handle nuclear retaliation. None of this comes easy or cheap. And yet, despite the costly investments, there can be no guarantee of no retaliation to the first user. Therefore, accepting NFU could ease arsenal burdens, reduce crisis instabilities and the concomitant risk of inadvertent escalation, invoke greater political positivity, and reduce the overall salience of nuclear weapons. In time, with a fall in the stock value of the weapons, it would encourage non-proliferation by sending a strong signal of the diminishing utility of nuclear weapons and also lessen the drive of each Nuclear Weapon State (NWS) for new and modernised nuclear arsenals. If all of the nuclear-armed states adopted such policies, nuclear weapons would begin to lose their salience, aiding the move towards their eventual elimination. In fact, given the contemporary reality where nations place a high value on nuclear weapons and are unwilling to discard them, NFU can provide a useful way-station. It allows nations to maintain a notional sense of security from their nuclear weapons, but significantly reduces the possibilities of their use. The problem, however, lies in getting seven out of the nine nations to accept NFU. This appears to be a steep climb in the current environment but it could be an effective step towards reducing risks because a country that accepts NFU would rather build an arsenal that signals deterrence through the ability for retaliation to cause punishment. This would entail counter-value and not counter-force targeting, which would bring down the quantitative and qualitative arsenal requirements.

A third measure can be seen around offering security assurances. Conventional asymmetry is one of the reasons that nations profess first-use postures. It would be worthwhile to find some positive incentives that can address these concerns. It may be recalled that the negotiation and conclusion of the Conventional Forces in Europe Treaty played a major role in addressing the US-USSR threat perceptions and enabled confidence-building. Can such arrangements be worked out in the case of the USA and China or Pakistan and India while also catering for India's threat perception from China? The proposition appears to be

extremely complicated, but some such solutions will need to be explored as risk mitigation measures.

Fourthly, commitments not to launch kinetic or non-kinetic attacks on each other's nuclear command and control, including space-based support assets, could be another measure to minimise the risk of pre-emption for fear of losing one's retaliatory capability. Agreements at the bilateral, trilateral, or multilateral levels that echo these commitments can reassure nations and, thus, reduce their anxiety to push the nuclear button, lest the other side's attacks degrade their deterrence.

Fifthly, chipping away at belief systems that suggest that limited nuclear wars are feasible can also be an important risk reduction measure. It should be remembered that it takes two to play the game of keeping a nuclear exchange limited. And, there can be no guarantee that the other side will have the same view of what is limited and choose to play as per the same rules. By believing that a nuclear war can be contained, one ends up making it more, not less, likely. And, if after the first such use, the first user is somehow able to show a successful ability to have kept the war limited, it could set a precedent that others could be tempted to follow. It would 'conventionalise' the use of nuclear weapons and make it appear normal to use small nuclear weapons in 'limited' ways. And then, when that small turns into not so small would be anybody's guess as new boundaries of use will be explored. Therefore, we need to marshal arguments to nip this idea now before we reach such a pass. Conduct of war-games at the Track II level could be one way of driving home the point that the use of nuclear weapons, despite bombastic projections, is not a militarily useful or politically prudent option.

The Last Word

Before signing off, I would like to thank Professor Matthew Bunn for his generous and encouraging support as a co-chair. His long experience in this field brought me the benefit of deep insights. Some of our zoom conversations, as we deliberated upon 'our pathways' on how to take this

group forward, became interesting sessions on deterrence and its practice across our nations. Dr Francesca Giovannini, Executive Director of the Project on Managing the Atom at the Harvard Kennedy School's Belfer Center for Science & International Affairs, provided solid support as the Principal Investigator of this project. I remain grateful to her for bringing me into this ambit and for consciously building the network to include voices from beyond the usual pale of the West. An exchange of perspectives from different regions made the tapestry of our webinars and in-person meetings so much richer, nuanced and meaningful.

Of course, this monograph would not have been possible without the scholarly work of our authors. My gratitude to them for their timely submissions, thoughtful revisions, and immense patience for the time it took to bring out the publication.

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Finally, it needs to be said that any mistakes of omission or commission lie at my doorstep.

Wish you happy reading and hope this generates new thoughts and writings,

Manpreet Sethi

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1. Possible Pathways to Nuclear Use in South Asia: An Indian Perspective

Tanvi Kulkarni

Introduction

A decade ago, questions about nuclear weapons use were not asked with the same urgency as they are today. As the vivid images of the atomic bombings of Japan, and the Cold War nuclear anxieties began to gradually fade from public memories at the turn of the century, imagining the actual outbreak of a nuclear war became primarily a matter of academic exercises, even as the threat of nuclear proliferation persisted. More recently, however, the growing international volatility precipitated by the geopolitical competition, rising global conflict and wars has stymied disarmament efforts and brought to the fore, once again, the risks and dangers of nuclear use. Leaders from nuclear armed states have engaged in far greater reckless talk about their arsenals than seen or heard since the Cold War, reminding us that the threat of nuclear war has not gone away after all.

A deeper understanding of the potential pathways to nuclear war and the impacts and consequences of nuclear use are no longer simply a subject matter of academic exercises, but, instead, key to developing urgent policy interventions that prevent, limit and minimise the human, environmental, economic, social and political costs. This essay seeks to contribute to the timely discussions initiated by the Research Network on Rethinking Nuclear Deterrence launched by the Belfer Center Project on Managing the Atom and its Working Group on Understanding and

Mitigating Pathways to Nuclear War.[1] More specifically, it discusses the potential for nuclear use in Southern Asia, home of three of the world's nine nuclear weapon powers. The essay hypothesises some plausible nuclear use case scenarios involving mainly India and Pakistan, and, in a few cases, also China. It draws upon published literature and previous scholarly engagements on India-Pakistan conflict escalation scenarios, as well as table-top exercises, and simulation games executed at Track II meetings and conferences. It takes conceptual and analytical inspiration from an extensive three-year study[2] organised by the Asia-Pacific Leadership Network, the Nautilus Institute, the Research Center for Nuclear Weapons Abolition at the University of Nagasaki, and the Panel on Peace and Security of Northeast Asia, examining potential nuclear use cases on, or involving, the Korean Peninsula and Northeast Asia—the only other region with security dynamics and nuclear risks comparable to Southern Asia.

What is a Nuclear Use Case Scenario?

In its first phase of research, the project on Reducing the Risk of Nuclear Weapon Use in Northeast Asia defined a "use-case" as an imagined situation leading to the detonation of one or more nuclear weapons in an attack or counter-attack against a military opponent.[3] This definition makes a distinction between the use and utility of nuclear weapons. By this definition, therefore, the employment of a nuclear deterrent threat or signalling itself is not considered as nuclear use. Similarly, the detonation of nuclear explosives or weapons as part of tests that do not involve an actual attack are also excluded from the definition of nuclear use cases. Furthermore, nuclear use (by an actor) can be intended or unintended/inadvertent. It involves, in either case, a decision by a human or a machine to denotate a nuclear device. So, the distinction between intended and unintended or inadvertent nuclear use has more to do with how the decision to use nuclear weapons came about, and it can be quite subjective. An accidental use of nuclear weapons is a special case of

unintended nuclear use, which results from factors like technical failures or miscalculations and such mistakes that can occur during relative peace-time and stablity or during crises.

A widely-used definition for a scenario in risk analysis is "a coherent, internally consistent and plausible description of a possible future state of the world."[4] Plausibility is, therefore, an inherent element of scenario analysis.[5] Based on specific assessments about the capabilities and intentions of actors, the presence of triggering events and enabling factors, and rough judgments about their likelihood and probability, some nuclear use case scenarios can be identified as more plausible and others as less plausible. That certain nuclear use cases are plausible does not mean, however, that these cases are likely or probable.[6] They are nevertheless certainly undesirable and all possible efforts should be made to prevent them from occurring. Our current efforts should especially be channelised toward identifying and discussing those cases which can be presented to policy-makers as reasonably relevant for urgent intervention.

Nuclear weapons use involving one or more nuclear-armed states can be triggered under a wide range of circumstances, particularly in the middle of ongoing conflicts or crises. In order to be able to discern a set of plausible scenarios, we need to pose some qualifying questions:

- Which of the actors possess the capacilities and postures which enable the use – and, more specifically, the first use – of a nuclear weapon? What are those capabilities and postures in terms of the actors' pronounced doctrines, delivery systems, warhead yields and types of weapons?
- Have any of the actors involved in the conflict expressed intent – and in what manner – in using (or responding) with nuclear weapons?
- What circumstances are most conducive for nuclear use and do those conditions present themselves during a conflict?
- What is the proximate trigger event?

- What incentives and disincentives are available to leaders (and commanders) during a conflict or crisis, to authorise the use of a nuclear weapon?
- How do the benefits of use of nuclear weapon compare to the cost of non-use of nuclear weapons for the actor (individual or state), in terms of the international and domestic implications?
- What firebreaks are available to the actors to resist nuclear use, and do these firebreaks work?

Plausible Nuclear Use Case Scenarios in Southern Asia

Southern Asia is home to three of the world's nine nuclear armed states – China, India, and Pakistan – that cohabit a proximate geostrategic space. What makes their nuclear dynamic uniquely complex is that these states have shared borders, overlapping territorial claims, and cross-conflict linkages with growing nuclear stockpiles, and expanding and modernising weapon platforms.[7]

There is currently no publicly available, systematic, and in-depth study on the possible triggers and pathways to nuclear use in Southern Asia. Much of the scholarly opinion that comes from within the region argues that a deliberate resort to nuclear war by any of the three nuclear-armed states is unlikely. This is primarily because for leaders in India, Pakistan and China, nuclear weapons have been instruments of deterrence (rather than tools for practical war-fighting) and nuclear war is perceived as unaffordable. In Southern Asia, therefore, there is a strong interest in nuclear peace.[8] Moreover, the political and military leaderships in India and Pakistan have been mindful of the geographical proximity between the two countries, which offers a short warning time – an hour or even a few minutes – for a crisis to unfurl with tit-for-tat actions from both sides.[9] And with the presence of nuclear weapons on both sides, the consequences of conflict escalation can be very dangerous.

South Asia-watchers, however, argue that in the India-Pakistan nuclear dyad, and, to a lesser extent, in the India-China dyad, there is a relatively higher possibility of inadvertent or accidental use of nuclear

weapons in Southern Asia. Given the inflamed nature of India-China and India-Pakistan relations and the limited tools avilable for effective crisis communication,[10] misreading and misperception of the intentions and capabilities of the adversary can cause accidental or inadvertent nuclear use. In Southern Asia, the fundamental conflict triggers are already present, with long-standing territorial disputes between India and Pakistan, and, to a lesser extent, between India and China. Nuclear use risks are further exacerbated by two factors. First, the expansion of conventional, nuclear, and dual-use capabilities that compress the action-reaction time during an actual conflict and create impulses for escalation. Second, the absence or breakdown of communication and dialogue mechanisms for crisis management and de-escalation.

Even though states may not seek actual escalation during crises, a conventional attack, sub-conventional attack, political crisis, domestic pressures, and political and military opportunism are just some of the factors that could serve as nuclear first use or counter-attack triggers. A key lesson from the Cold War crises and pre-nuclear conflicts is that crises and conflicts can spin out of control, sometimes driven by particular events that no leader intended or expected. We can, therefore, build a number of specific operational scenarios with scope for escalation to a nuclear exchange involving India, Pakistan and even China (see Table 1 below).

The cases, particularly the trigger events, hypothesised in Table 1 are inspired from actual scenarios that have either taken place in recent history or have been considered in nuclear war-gaming exercises involving nuclear experts and retired practitioners at Track II meetings. Using the parameters listed earlier in this essay, each nuclear use case scenario is then identified as either low, medium or high on the degree of plausibility. These judgments are, however, speculative. Nonetheless, they highlight the potential of a scenario to escalate to a case of limited or massive nuclear use; scenarios judged to be highly plausible particularly deserve greater scrutiny. The nature of escalation in each of the cases of nuclear use – usually the first use – by the actor or actors involved in the

scenario, is further categorised as inadvertent or deliberate or accidental. The cases listed in the table are not exhaustive but indicative. It is also relevant to note that there is no obvious likelihood of these events happening in the immediate or distant future. They are plausible 'under some specific circumstances.'

Table 1: Possible Triggers for First Use of Nuclear Weapons in Southern Asia

Case	Actors Involved	Trigger Events	First Use and Conflict Progression	Nature of Escalation	Degree of Plausibility
1.	India and Pakistan	A perceived or actual Indian surgical strike into Pakistani territory provokes Pakistan to respond quickly in an act of self-defence and deterrence.	Pakistan undertakes a demonstration attack with a low-yield short-range nuclear weapon on Pakistani territory to stop the Indian troops from advancing. India reads this as a nuclear attack on Indian forces and launches a nuclear counter-attack across the Line of Control (LoC).	Inadvertent	High
2.	Pakistan and India	In the midst of a limited conflict, an Indian airstrike inside Pakistani territory hits a road mobile dual-use missile launcher carrying a nuclear warhead, causing a nuclear device to explode on Pakistani territory.	Pakistan perceives this as a deliberate nuclear escalation by India and responds with a nuclear (counter) attack.	Inadvertent	High

3.	India and Pakistan	A medium-range dual-use supersonic cruise missile (like the Brahmos)[11] is accidentally launched from India during relative peace-time. The missile follows a pre-assigned trajectory and hits a military target in Pakistani Punjab.*	Pakistan perceives this as a nuclear first use (attack) by India and responds with its own nuclear weapons counter-attack in Western India.	Accidental	Medium
4.	India and Pakistan	Renewed border tensions on the LoC escalate into an armed conflict. India puts its nuclear submarines INS *Arihant* and INS *Chakra* on high alert. Pakistan signals nuclear deterrence by conducting a dual-capable ballistic missile test. In the throes of the crisis, INS *Arihant* misinterprets the Pakistani missile test as an incoming nuclear attack and launches a missile intended to hit Pakistan's Gwadar naval base.	Pakistan perceives this as an Indian nuclear first use and launches a nuclear counter-attack on India.	Inadvertent	Medium

* This scenario is no longer completely hypothetical after the Brahmos Missile firing incident of 2022.

5.	Non-State Actor, India and Pakistan	A terrorist group claims responsibility for a major attack at a public site in India or a major Indian city using multiple radiological dispersal devices (or chemical or biological weapons). The group's operations are traced back to Pakistan. India perceives this as a sub-conventional attack by Pakistan on India and launches conventional assaults across the LoC.	Pakistan uses a low-yield short-range nuclear weapon on the oncoming Indian troops on Pakistani territory. Indian launches a limited nuclear counter-attack.	Deliberate	Medium
6.	Pakistan and India	A ground war starts across the LoC. Four months later, Indian forces are able to push back the Pakistan Army to gain a portion of the Pakistan-administered side of the LoC.	Pakistan claims India has crossed its nuclear red line and launches a strategic nuclear attack on an airfield in Northern India, to achieve a military breakthrough.	Deliberate	Medium

7.	India and Pakistan	Protracted border skirmishes on the India-Pakistan border break into a limited war, with Indian troops crossing the LoC.	Pakistani military commanders order a low-altitude detonation (airburst) of short-range tactical nuclear weapons as a demonstration strike to repulse an invasion by the superior Indian forces. The attack leads to heavy casualties of Indian troops.[12] India launches a strategic nuclear counter-attack.	Deliberate	Low
8.	Pakistan and India	Protracted border skirmishes across the LoC rapidly escalate to a limited war with Pakistani troops crossing the Indian border and the Pakistan Air Force bombarding Indian Army garrisons and airfields in Northern India.	India responds with a nuclear counter-attack on the Pakistan Air Force stations in Punjab.	Deliberate	Low
9.	Pakistan and India	A domestic or regional terrorist organisation detonates a nuclear warhead in a major Pakistani city (like Rawalpindi/ Islamabad).	Pakistan believes that India provided nuclear weapons to the terrorist organisation and launches a nuclear attack against India.	Deliberate	Low

10.	Pakistan and India	Amidst rising tensions and conflict on the LoC, a perceived provocation by India crosses one of Pakistan's 'red lines.'	In response, the Pakistan Nuclear Command Authority authorises ground-launched Babur cruise missile strikes on Sarsawa Air Force Station in Uttar Pradesh, India.	Deliberate	Low
11.	Pakistan and India	Amid fears of crisis escalation on the LoC, the Pakistani leadership is convinced that an Indian attack on Pakistani territory is imminent.	Pakistan launches a pre-emptive nuclear strike on Indian military installations in Jammu and Kashmir/Rajasthan and Punjab.	Deliberate	Low
12.	Pakistan and India	In the midst of a major domestic and economic crisis, the Pakistani leadership is convinced that India will use the opportunity to attack Pakistani territory across the LoC.	Pakistan launches a pre-emptive nuclear strike on Indian military installations in Jammu and Kashmir/Rajasthan and Punjab.	Deliberate	Low

13.	India and Pakistan	Perceived or actual Pakistani provocation, spurs an Indian conventional attack on the Pakistan side of the LoC.	Pakistan launches a pre-emptive nuclear strike in an effort to terminate the war on its terms/ to stop a feared conventional defeat/ to force the international community to intervene. India launches a nuclear counter-attack on Pakistan.	Deliberate	Low
14.	India and China	Large-scale fighting in Eastern Ladakh involves Beijing and New Delhi exchanging nuclear signals through verbal statements and deployment of nuclear-capable dual-use weapons. Third party intellligence warns India that Beijing may launch a nuclear attack to remove India's retaliatory capability.	A malfunction in the early warning systems warns of an incoming nuclear attack from China, and India prepares to launch a retaliatory strike.	Inadvertent	Medium

15.	India and China	A significant cyber-attack breaches the Indian nuclear command and control system.	A unauthorised sea-based nuclear missile is accidentally launched from India toward China. China detects the nuclear launch and prepares a nuclear counter-attack on India.	Accidental	Low

The fifteen hypothetical nuclear use case scenarios listed in Table 1 above are set within the context of the stated nuclear postures of China, India and Pakistan and their present and potential nuclear capabilities. They range mostly from a medium degree of plausibility to a low degree of plausibility, indicating that nuclear use will take place. We can, if we let our imagination run too wild, think of a larger number of potential nuclear use case scenarios, especially in the crisis-prone India-Pakistan dyad. It is, however, useful to keep in mind the political and strategic contexts of the dyad (or the triad). For instance, despite their nuclear rivalry, India and Pakistan, derive great value from the bilateral Confidence Building Measures (CBMs) that have been negotiated between them and see merit in retaining these existing CBMs.[13] Both countries have used mechanisms like hotlines and back-channel talks to diffuse and de-escalate crises and stalemates in the past.[14] Similarly, the corresponding nuclear no-first-use postures of China and India are expected to lessen the possibilities of nuclear misperceptions and inadvertent escalation.[15]

Based on the stated nuclear policies and postures of the three nuclear actors, Pakistan, as a first user, is more likely to be involved in cases of both deliberate and unintended (including accidental) nuclear use. Inadvertant nuclear escalation in both dyads is more plausible, and at least two India-Pakistan scenarios in the above list are considered to have a high degree of plausibility. In both these cases, nuclear escalation happens rapidly in the

throes of war. Two inadvertent/accidental nuclear use case scenarios between India and Pakistan are considered to have a medium degree of plausibility. These scenarios are wrought with misperceptions, misinterpretations, and deficiency of effective channels of communication between the two nuclear-armed neighbours. One scenario including India and China, has been marked with a medium degree of plausibility. This is a case of a warning system malfunction, similar to the events that occurred in the 1983 Able Archer military exercise incident.

Two scenarios involving India and Pakistan, hypothesised to feature deliberate nuclear escalation by at least one of the actors, are considered to have a medium degree of plausibility. These are based not only on the stated nuclear doctrines of the two countries, but on the assumption that the Indian leadership is most likely to retaliate conventionally to a terrorist attack on India by groups operating from Pakistan, based on the belief that there is scope for limited war below the nuclear level. Pakistan, on the other hand, maintains zero tolerance for any limited conventional action by India.

In terms of pathways to nuclear escalation, first nuclear use or counter-use in these scenarios ranges from the incentives to stop a feared conventional defeat; to achieve a military breakthrough; to protect national nuclear arsenals from the imminent threat of destruction or seizure; to limit damage in a situation where it is assumed that nuclear war is inevitable; to respond to false alarms or accidents; to respond to miscalculations and misinterpretations of the other's intentions, actions and capabilities; to respond to actions by non-state terrorist actors; and to cope with domestic compulsions such as economic collapse.

Conclusion

It has often been pointed out that despite several crises between India and Pakistan, there have been no nuclear weapon-related incidents in Southern Asia. This is arguably attributable to a strong nuclear taboo of non-use that operates in the India-Pakistan nuclear dyad.[16] As nuclear-armed actors

that are sensitive to changes in the global nuclear order, the India-Pakistan nuclear dyad is, however, not impervious to the fraying of international norms around nuclear weapons. The absence of a serious strategic 'full-spectrum' political dialogue in a crisis-prone relationship opens great scope for misunderstandings and misinterpretations that could lead to accidental or inadvertent use of nuclear weapons. Especially when a crisis moves swiftly to the level of armed hostilities, military forces are faced with challenges related to geography and tactical decisions to be taken and executed within very short timeframes.[17] *Quid pro-quo* strategies and escalation in such scenarios are very hard to calibrate and execute.[18]

As nuclear capabilities grow, particularly a significant qualitative and technological change in the adversary's nuclear arsenal – for instance, the acquisition of missile defence systems or Artificial Intelligence (AI)-powered cyber capabilities – can impact deterrence dynamics and thereby an actor's decisions to use, or counter-attack with, nuclear weapons. Besides, a conflict could evolve in more than one direction, determining and creating space for bargaining at the negotiating table.

In any case, a key takeaway from this discussion should be that nuclear use, whether intended or unintended, will have catastrophic consequences. And so the best chance of avoiding nuclear use is identifying and addressing escalation triggers and early crisis de-escalation. The famous science-fiction Hollywood movie, WarGames,[19] from the Cold War era had an apt line that should serve as a reminder today. Referring to nuclear war, the computer concluded: "A strange game. The only winning move is not to play."

Notes

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2. Pathways to Nuclear Escalation in South Asia: An Indian Perspective

Rajesh Kumar

Whenever there is a discussion on the issue of nuclear deterrence and stability in South Asia, there appears to be a large body of academic work that suggests that a conventional military conflict between the two states could rapidly escalate into a nuclear conflict. Combined with the traditional animosity between the two countries and the unresolved issues since the partition, as well as the history of wars between the two nuclear armed countries, the crisis stability is assessed to be weak. In fact, the International Institute for Strategic Studies, in its primer of May 2021 notes that "the risks of a mistaken catastrophic nuclear deterrence failure between India and Pakistan are too high to let chance play the same role in the next security crisis as it did in February 2019" and that "grave deficiencies in and asymmetries between India's and Pakistan's nuclear doctrines are compounded by mutual disbelief, existing and emerging military capabilities, and the prolonged absence of related dialogue mechanisms".

These conclusions, however, fail to account for other factors that bring stability even during periods of extreme crisis. One key stabilising influence is that both countries' leaderships recognise that both have built some second-strike capability that will exist on both sides in the eventuality of nuclear weapon use by one side. Partly for that reason, the nuclear taboo continues in the minds of the authorities who control nuclear weapons. Despite some loose rhetoric about use of nuclear

weapons from both sides, the nuclear taboo has held for the time being. As McGeorge Bundy observed in 1969,

> There is an enormous gulf between what political leaders really think about nuclear weapons and what is assumed in complex calculations of relative "advantage" in simulated strategic warfare. Think-tank analysts can set levels of "acceptable" damage well up in the tens of millions of lives. They can assume that the loss of dozens of great cities is somehow a real choice for sane men. They are in an unreal world. In the real world of real political leaders—whether here or in the Soviet Union—a decision that would bring even one hydrogen bomb on one city of one's own country would be recognized in advance as a catastrophic blunder; ten bombs on ten cities would be a disaster beyond history; and a hundred bombs on a hundred cities are unthinkable.[2]

It can be argued that this lesson has been internalised by the leaderships of both countries, as also perhaps by other nuclear weapon states. Some evidence of this can be found in the recent Russian nuclear rhetoric as well as the nuclear signalling in the course of the ongoing Russia-Ukraine War. While brinkmanship has been intense and crisis stability appears to be on the verge of breaking down with the possibility of Russian nuclear use, the world still has a degree of confidence that Russia may not break the nuclear taboo.

It is against this backdrop that the pathways to nuclear escalation in South Asia need to be examined amidst the current security situation in the world as a whole, and in South Asia in particular. It would also be worthwhile to mention that any discussion on strategic and crisis stability, as it relates to South Asia, normally alludes to the dyad between India and Pakistan. Generally, China is excluded from the discussion. However, it plays an important role in the strategic stability of the region, especially so in the India-China dyad, even if its contribution to crisis

instability is underplayed due to the "No First Use" (NFU) policies of the two states. It is, therefore, interesting to note that despite the crisis in Eastern Ladakh over the last three years and the large deployment of troops on both sides of the border, the nuclear dimension has not been spoken of yet. By contrast, during the 2019 'engagement' between India and Pakistan, the atmosphere was thick with nuclear rhetoric.

Reviewing the crisis stability in the Indo-Pakistan context, there are some pathways that could lead to nuclear escalation in South Asia. Some of the identified pathways are listed as under:

- Nuclear use to stop a feared conventional defeat.
- Nuclear use to achieve a military breakthrough.
- Nuclear use when nuclear weapons in the field are threatened with destruction or seizure.
- Nuclear use based on the belief that nuclear war is inevitable and, hence, pre-emption could provide an advantage compared to not doing so.
- Nuclear use due to a false alarm or nuclear accident.
- Nuclear use due to miscalculation of the other's intention to launch.
- Nuclear use due to terrorist action in the midst of a crisis.
- Nuclear use as a last act of revenge if one's own side is being destroyed.
- Nuclear use due to a domestic reason/compulsion (civil-military friction; personality of leadership; religious factors).

Within this list, there are some pathways that can be considered of such low probability that the cause for worry on those counts is the least. One such pathway with a very low likelihood of leading to nuclear use is the one that suggests such an eventuality owing to domestic compulsions, whether it is due to civil-military friction, the personality of the leadership or religious factors. The major reason for this is that despite all the rhetoric on this front, the leadership on both sides can be expected to be sufficiently mature to understand the implications of use of nuclear weapons and the inevitable response from the other side.

No leadership would want to leave future generations of its population in a radioactive morass for the sake of its ego or religion. Furthermore, a scenario wherein an internal crisis could set off a nuclear strike without any external tension would certainly invite such severe international action (including sanctions) that the survival of the state using nuclear weapons would be under severe stress. Most leaders are likely to find such actions to be self-defeating, and, hence, this pathway is improbable.

Similarly, nuclear use due to a false alarm or accident too is unlikely as each side has certain Confidence-Building Measures (CBMs) in place such as the agreement to not attack each other's nuclear facilities, as well as the pre-notification of ballistic missile tests. These CBMs have so far held up reasonably well. In fact, the exchange of lists of nuclear facilities takes place on January 1 every year. Hence, it would be incorrect to assume that a nuclear trigger would be pulled before verification of the facts in the case of a nuclear accident. In the case of false alarms, in the Indo-Pak scenario, due to the very low time interval between an indicated launch and impact, it is virtually impossible to rely on "launch on warning". Hence, the affected side would have to verify an impact before responding.

Nuclear use when nuclear weapons in the *field* are threatened with destruction or seizure is also an improbable pathway to a nuclear exchange. If any one side believes that a second-strike capability exists with the opposing force, it will stop short of a nuclear attack on nuclear weapons as that would certainly lead to retaliation. It is, however, possible that the nuclear weapons may be destroyed in a conventional strike. This may cause a decision dilemma for the side whose weapons are destroyed and, therefore, it will need to assess whether the strike was specifically targeted at the nuclear weapons or simply a case of misidentification.

One way of mitigating such a situation and reducing the chances of escalation would be to deploy nuclear forces in the field only when a nuclear threat from the adversary is imminent. In case tactical nuclear weapons are deployed in the field as per doctrinal requirements, a robust

command and control is necessary. Deploying such weapons too far ahead and leaving the forward commanders with the ability to launch such weapons would be a recipe for disaster. No rational country is expected to allow such a situation to develop and it would think through such a scenario before taking the action of deployment of nuclear weapons in the field. The threat of seizure of nuclear weapons exists only if one side has made significant gains in the conventional realm. In such case, other pathways to nuclear use would already be at play prior to this eventuality.

Nuclear use due to terrorist action in the midst of a crisis is also highly unlikely. So far, retaliatory actions against terrorist strikes have not been immediate. This is because any successful terrorist strike has the element of surprise and it takes time to investigate as to who is the responsible party. Once that has been ascertained, retaliatory action needs planning and organisation of resources. Whatever the provocation may be, the preferred mode of retaliation against an amorphous enemy would fall within the realm of conventional operations. It is simply not wise to use nuclear weapons against a set of people whose whereabouts may be uncertain and who may mix seamlessly with the local population. In fact, terrorist action can spark off a conventional conflict that could spiral out of control to a nuclear one. That pathway is discussed later, and is perhaps more worrisome, than the possibility of nuclear use against a terrorist organisation.

The most probable pathway to nuclear use is miscalculation. The main reason for this is that both India and Pakistan appear to know each other's psyche well and seem confident of being able to outguess each other. Coupled with this is the belief on both sides that the doctrine of the other is not credible. There has been much public to-and-fro on the credibility of each other's doctrine and strategy in Track II meetings. Therefore, during a crisis, there is a serious threat that one or both sides may miscalculate.

Which side may miscalculate is a matter for debate as both sides defend their position to the ground. From India's side, the doctrine

appears to be to wait until the first strike has been undertaken by the adversary. In recent years, there has been internal debate on whether the *no first use* policy should be changed. There are no indications that the government has made any changes despite some statements made in varying contexts. Complicating the issue is the fact that any time nuclear use is considered, it will usually be preceded by a period of intense crisis. If a conventional war is in progress, it will throw up its own fog and friction, making decision-making difficult. It is also during such a crisis or war-time period that other forms of hybrid warfare such as cyber operations, psychological operations, information operations and false flag operations take place. Hence, this is a time when serious miscalculations can take place due to one, or a combination, of these factors.

Usage of nuclear weapons to stop a feared conventional defeat is Pakistan's stated policy. It envisions using tactical nuclear weapons to stop Indian armoured formations in case of a conventional conflict with India. The Nasr short-range missile is touted to provide "flexible deterrent options" in order to have "full spectrum deterrence" against India. Loosely, this is an adaptation of the "flexible response" strategy adopted by the North Atlantic Treaty Organisation (NATO) during the Cold War, with a Pakistani logic of deterrence. The policy has been internally debated in Pakistan and some of the cons that emerge are that use of tactical nuclear weapons could lead to a full-blown nuclear war which, in turn, would lead to unacceptable damage on both sides. Indeed, such has been the outcome of most war-gamed scenarios even if they initially postulated that a limited nuclear war was possible. Also, calculations show that the number of nuclear weapons needed to stop an enemy armoured formation would be significantly large and this level of investment in tactical nuclear weapons could detract from the number of weapons that may be needed to cause unacceptable damage to the enemy should a full-blown nuclear war break out.[3] The case of the use of nuclear weapons in order to achieve a military breakthrough is considered improbable due to the sheer numbers needed to make a significant breakthrough as well as

the difficulty in sending one's own forces into that nuclear wasteland to capitalise on the breakthrough. The US and NATO forces also realised these disadvantages and their tactical nuclear weapons stockpiles have decreased significantly since the end of the Cold War.

While Pakistan remains ostensibly invested in this strategy, it could be postulated that using nuclear weapons early in the case of a conventional conflict may present the planners with difficult targeting options since deterrence, at least of a large scale conventional attack, would have failed at this point. Under Pakistan's doctrine, the use of nuclear weapons would then be considered if the conventional forces of India attain such a serious advantage so as to cause an existential threat to Pakistan. Here again, the caveat of miscalculation that was stated above applies.

Preemptive use of nuclear weapons based on the belief that nuclear war is inevitable is not logical thinking. Such beliefs arise out of miscalculation of the adversary's intentions. The sum total of all wisdom in the writings on nuclear strategy and doctrine indicates that nuclear weapons are for deterrence. The only cases that warrant use outside of deterrence are launch on warning (i.e. believing that the enemy has launched a weapon or the flexible response strategy which Pakistan calls full spectrum deterrence), as stated above.

Nuclear war is never inevitable and can be avoided at any stage with an understanding of the situation. In any conflict that starts with a conventional war, use of nuclear weapons can be avoided by not posing an existential threat to the adversary and having a clear understanding of one's objectives. A victory won in a conventional conflict would quickly turn into a loss because in a nuclear war there are no winners – only losers and bigger losers.

Nuclear use as a last act of revenge if one's own side is being destroyed is a pathway that is possible if the threat to the state in question is existential. But, as the war in Ukraine has shown, the landscape of war is evolving; with more urban settlements that are fairly large as compared to scattered rural settlements of the earlier eras. At the same time, non-

nuclear weapons have grown in lethality and are capable of causing very high levels of destruction. These weapons are easily operated by small teams due to the advances in technology. Hence, we see that a conventional war occurring in a terrain largely made up of urban settlements, does not allow quick bypassing of strongholds while continuing to make rapid gains in the kind of manoeuvre warfare that forms the basis of many an Air-Land battle doctrine. Instead, conventional war has become more positional and has also become a war of attrition, with defensive troops fighting to the bitter end amongst urban ruins.

Thus, the stage of "one's own side being destroyed" may not come as quickly as in past conflicts, since the defensive side in the conflict will have residual combat potential to undertake counter-offensives on invading forces held up in urban terrain. Nevertheless, history is replete with examples of strategic and tactical surprises, poor generalship, logistic failures and simply unprofessional behaviour that have led to annihilation of forces. In such a scenario, if the existence of the state is threatened, it could lead to the use of nuclear weapons. In a conflict between two nuclear armed states, it should be a priority of the leadership on all sides to be sufficiently informed of the gains one can achieve before the onset of a nuclear response.

What future pathways could evolve that could impact crisis stability in the Indo-Pakistan context? The development of a robust Ballistic Missile Defence (BMD), along with a very advantageous Intelligence, Surveillance, Reconnaissance (ISR) capability on either side could tempt that side to brandish the nuclear sword in the belief that a counter-force strategy would wipe out a majority of nuclear weapons on the other side while retaining the capability to "handle" the remaining opposing nuclear forces through BMD. This kind of pathway, though improbable, needs to be watched carefully as technology has ways of upending established military and strategic doctrines, operations and postures.

Finally, it would be worthwhile to examine the effect of the rapid emergence of Artificial Intelligence (AI) as a technology that could affect

decision-making in the nuclear domain. While AI, as it is conventionally understood, helps to sift through a wide canvas of information rapidly and assist the decision-maker to make a decision, in reality, the generative AI systems are Large Language Models (LLMs) that distill information from large datasets, in some cases including by scouring the internet.

As stated above, a large portion of academic work tends to hypothesise that a crisis in the Indo-Pakistan setting could quickly escalate into the nuclear domain; hence, the result of assistance from such a model could be inherently escalatory by itself. It would be prudent to exclude AI tools from the decision-making process until such time those tools can be "trained" to be instruments of peace rather than war. In the recent past, there have been initiatives to get states to commit to a political declaration on responsible military use of AI[4], however, there are differences in the manner in which states are cooperating on the issue. The recent example of China distancing itself from a proposed agreement on non-use of AI in nuclear command and control[5] is a stark reminder that the issue is still work in progress.

In conclusion, the most probable pathway to nuclear use in the subcontinent is miscalculation or misinterpretation of each other's intention in the midst of a non-nuclear conflict. This is likely to be exacerbated by multi-domain operations such as cyber warfare, information warfare, psychological warfare and the fog and friction of conventional warfare. The leaderships of both countries should focus on deliberate decision-making after ascertaining the necessary facts on the ground before assuming the worst. The leaderships should also be aware of the red lines of the opposing side in order to avert nuclear escalation.

In any crisis between two nuclear armed adversaries, the objectives of conflict must be carefully tailored to control escalation. As Carl von Clausewitz stated, "*War is not merely a political act but a real political instrument, a continuation of political intercourse, a carrying out of the same by other means*". Therefore, the political objectives of any war must stop short of posing an existential threat to a nuclear armed state.

Other pathways such as the pre-emptive use of nuclear weapons as well as use to achieve a military breakthrough are considered improbable as the nuclear taboo holds for the present. Care should be exercised in following a "full spectrum deterrence" strategy as it may not enhance deterrence. Emerging technologies should be carefully watched for their effect on crisis stability, and AI usage in decision-making should be minimised as decisions in the nuclear domain have far-reaching impacts that cannot be rolled back once they take effect.

Notes

1. Antoine Levesques, Desmond Bowen, John H Gill, "Nuclear Deterrence and Stability in South Asia: Perceptions and Realities", IISS, p. 57.
2. McGeorge Bundy, "To Cap the Volcano," *Foreign Affairs*, XXXXVIII, October 1969, pp. 9–10, Google Scholar
3. Mansoor Ahmed, "Pakistan's Tactical Nuclear Weapons and Their Impact on Stability", 2016, http://carnegieendowment.org/2016/06/30/Pakistan-s-tactical-nuclear-weapons-and-their-impact-on-stability-pub-63911
4. https://www.state.gov/political-declaration-on-responsible-military-use-of-artificial-intelligence-and-autonomy-2/
5. https://timesofindia.indiatimes.com/world/china/china-refuses-to-sign-agreement-to-ban-ai-from-controlling-nuclear-weapons/articleshow/113235217.cms

3. Possible Pathways to Deterrence Breakdown in South Asia: A Pakistani Perspective

Feroz Hassan Khan

Southern Asia has some unique characteristics that make strategic stability more uncertain than elsewhere in the world. With a regional construct wherein three nuclear-armed states meet at the trijunction of a disputed region, Kashmir, it is vital to consider possible pathways to nuclear escalation. The nature of the disputes and the intensity of crises between India and China significantly differ from the India-Pakistan dyad; overall, the seemingly unending conflicts and complexities between India and Pakistan pose greater concerns.

In the past 25 years, China, India, and Pakistan have developed a triad of strategic forces amid periodic military crises and political tensions. China and India have engaged in military crises in the Himalayas, but these crises were less escalatory, with both sides following a no-shooting accord and pursuing a process of military negotiations and political engagement to de-escalate the crises. In contrast, India-Pakistan crises are more frequent, violent, and sudden, with no follow-on negotiating process or structure for crisis management or de-escalation.

This paper focusses on the probability of nuclear-use pathways in an India-Pakistan crisis and what escalation dynamics might take place. The analysis is based on years of research during real-time crises and the author's experience and participation in Track II dialogues and crisis simulation table-top exercises. This paper will review risk-taking

strategies in a fragile regional strategic environment that could form the basis of a possible strategic deterrence breakdown, followed by an analysis of a spectrum of scenarios or pathways leading to possible nuclear use in the region.

Fragile Strategic Environment and Risk-Manipulating Strategies

India and Pakistan emerged as conflict-born neighbours, resulting from the complex political, geographic, and religion-based separation following independence from Britain in 1947. The onset of the Cold War and the invasion by the People's Republic of China in Tibet brought China to the doorsteps of South Asia, further complicating its tense security environment.[1] As each decade passed, the conflicts between India-Pakistan and China-India deepened after a series of regional wars and military crises. Both India and Pakistan suffered humiliating military defeats in the wars of 1962 and 1971 respectively, which remain as indelible historical scars in the security thinking of both states. While China and India painstakingly negotiated border tranquillity agreements in the 1990s, India and Pakistan failed to follow up after the Lahore Agreement, 1999. Failure to negotiate a *modus vivendi* resulted in military competition and a nuclear arms race, while power differentials among the three states widened, and crisis instability conditions increased, making the region more susceptible to wars and potential nuclear use.[2]

Three India-Pakistan Wars in the pre-nuclear era resulted in escalation from sub-conventional operations (crises in Kashmir and East Pakistan/Bangladesh) to major conventional wars in 1948, 1965, and 1971. Since then, periodic and recurring military crises have continued, with both countries adopting risk-manipulating strategies despite the advent and progression of their nuclear capabilities.[3] Nuclear capability, rather than dampening competition, gave a sense of security assurance against major conventional wars, allowing sub-conventional strategies to continue. India blames Pakistan for continued support to the Kashmir insurgency and for

the terrorist groups that strike into India, whereas Pakistan accuses India of sponsoring Baluch separatists. The region remains on the edge.

The Indian military, in its search for options to deal with what it calls continuing cross-border terror, and what Pakistan maintains is separatist insurgency in Kashmir, has developed a concept of a limited war under the nuclear umbrella. It pledges the use of conventional forces as a retaliatory response to repeated cross-border terror attacks, taking advantage of its force structure advantage against a geographically narrow and economically weaker Pakistan. Over the years, India has improved the doctrine, adding greater firepower, faster mobilisation, and improved logistics to inflict a swift, punitive response into mainland Pakistan (colloquially known as the "Cold Start"). In response, Pakistan has recalibrated its doctrine to offset its asymmetries through a combination of conventional force "comprehensive response" and "full spectrum nuclear deterrence" that includes the deployment of short-range Tactical Nuclear Weapons (TNW) in the battlefield.[4] India has reacted by introducing the concept of "surgical strikes" into its doctrine, which involves selective cross-border targeting with limited force (special forces) and precision-guided munitions with air or ground missiles applying beyond visual range systems. Pakistan, in turn, has announced a "*quid pro quo plus*" strategy, implying it would respond in kind and escalate a notch up the ladder.[5] The February 2019 Pulwama-Balakot crisis demonstrated some of these concepts, foretelling pathways for future conflicts. The crisis de-escalated as both countries fortuitously found an offramp when Pakistan returned the Indian Air Force pilot shot down during the crisis, resulting from some timely back-channel diplomacy. While the diffusion of this crisis indicates the desire in both countries not to escalate, the absence of any structure bilateral agreement to manage such crises gives little confidence of timely de-escalation in the future. What if the offramp was not available?

Another complicating factor is the doctrinal dissonance between India and Pakistan. India has an officially declared nuclear doctrine

pledging No First Use (NFU) but with three qualifying caveats: that India's deterrence force posture is not static and will be dynamic; it will massively retaliate against any nuclear attack on India or its military forces anywhere within or outside the Indian territory; and it will use nuclear weapons in response to chemical or biological attacks on its forces anywhere. Pakistan dismisses India's NFU pledge, pointing to these caveats. Unlike India, Pakistan has chosen to not officially declare its nuclear doctrine, but has made clear through various public statements that it retains a first use option through a mix of conventional and nuclear deterrence.[6] Following the introduction of short range missiles with TNWs to counter the Indian concept of limited war, it has declared a *full spectrum deterrence* policy that involves the "possession of nuclear weapons for strategic, operational, and tactical ranges that cover the large Indian mass and its outlying territories."[7]

These doctrinal asymmetries between India and Pakistan, compounded by emerging military and technological capabilities and the absence of any strategic dialogue or effective risk reduction mechanisms, significantly increase the chances of deterrence breakdown.[8] The likely strategic risks of deterrence failure are mainly two: an escalating conventional war leading to nuclear use; and/or the accidental launch of a conventional or nuclear weapon due to a technical glitch – as happened with a conventional cruise missile in March 2022.[9]

Likely Pathways to Nuclear Escalation

Despite several crises and large differential in size and national power between India and Pakistan, nuclear weapons have deterred large scale aggression and brought some semblance of stability. Yet the notion that nuclear capability is a "great equaliser" is problematic. Nuclear weapons have never deterred terrorist organisations; and now sophisticated arsenals and innovative technologies in the inventories of conventional militaries provide many tools that can penetrate the nuclear deterrence shield. Contemporary security threats are challenging the legacies that formed the

basis of strategic stability in the previous century. Another complicating factor in the case of India and Pakistan is that neither side believes in the other side's core tenets or the rationales for its strategic doctrines.[10] Though both have more than sufficient nuclear weapons to strike or retaliate , both are prepared to exploit the vulnerabilities of the other with multiple non-nuclear means. Under these uncertainties and in the absence of any formal arrangement of reassurance, the probability for deterrence breakdown is greater than the prospects for a stable mutual deterrence relationship.[11] Given this, I analyse four possible pathways that could lead to nuclear weapons employment in the region.

Nuclear Use to Stop a Feared Conventional Defeat

The most likely pathway to a nuclear exchange would be an outcome of an escalating conventional war where both sides are struggling to regain escalation control and re-establish deterrence. In general, Pakistan has several vulnerabilities that are prone to exploitation in a crisis scenario. Pakistan's elongated geography and lack of strategic depth makes it tempting for the Indian military to wage multiple offensive thrusts into Pakistani territory. Combining mechanised force manoeuvres with intensive firepower, these operations would be aimed at inflicting maximum destruction of the Pakistani armed forces.[12] Additionally, Pakistan is economically dependent on a single coastline, with few ports, creating opportunities for naval strangulation. At the same time, Pakistan's perennial political tensions and domestic instability make it susceptible to external exploitation.[13]

Conscious of these vulnerabilities, in 2002, Pakistan unofficially announced four criteria that could lead to a decision to employ nuclear weapons first:

- If India attacks and conquers large part of its territory (space threshold);
- If India destroys a large part of Pakistan's military forces (destruction threshold);

- If India undertakes a naval blockade to strangle Pakistan's economy (economic strangulation); and
- If India pushes internal destabilisation through large-scale subversion (domestic destabilisation).

These thresholds are deliberately ambiguous, to create uncertainty in the minds of Indian strategic planners.[14] At any stage during an escalating military operation, the Pakistani National Command Authority (NCA) could alert or ready its nuclear weapons and move its short-range TNWs from peace-time storage to battlefield deployment areas. Pakistan will *not* hesitate to use nuclear weapons if its NCA determines its red lines have been crossed and an unacceptable conventional defeat is imminent. In a limited war, India's hope is that its officially declared pledge of massive retaliation would deter Pakistan from nuclear use; similarly, Pakistan hopes its ambiguous nuclear first use would deter India from starting cross-border operations. Such assumptions by both might lead to either side calling the bluff and, hence, deterrence failure. . Further escalation up the ladder would be dependent on the choice of nuclear weapons and target-sets each side might use in the follow-on exchanges. There are no obvious de-escalation strategies after the first exchange takes place.

Nuclear Use When Nuclear Weapons in the Field are Threatened with Destruction or Seizure

India's limited war concept is premised on the high reliability of escalation control. Such a presumption is highly dangerous in the fog of war wherein its armed forces could inadvertently attack strategic assets, degrade command and control infrastructure, or target any dual-use air, land, or sea capabilities that Pakistan sees as strategic. Such a situation would certainly prompt a retaliatory nuclear response. If a conventional attack on a deployed nuclear weapon or storage site/silo inadvertently results in a nuclear detonation or damages the nuclear warhead, resulting

in radioactive contamination, it will probably be construed as a nuclear strike and retaliation is likely to occur.[15]

In a conventional ground invasion, it is probable that advancing land forces could encounter TNWs on the battlefield. Three possible scenarios could occur. First, the deployed forces in the field – facing a use it or lose it dilemma – could employ nuclear weapons directly on the advancing conventional forces. Second, the invading forces may bypass the deployed TNWs and manoeuvre deeper into invading territory without directly encountering them. In such situations, nuclear weapons could target the invading follow-on forces, especially if the loss of territory is deemed as a crossing of a red line. In a third scenario, the TNWs along with the crew, could be seized on the battlefield by the advancing forces.

The circumstances of the seizure of weapons are important. If the NCA has delegated use authority to the local field commanders, there is every possibility that the field commander would rather use the weapon than allow its seizure. Alternatively, if TNWs are under centralised control (negative control) and use codes are not available in a timely way to the field commander, the nuclear weapons could be captured intact. Under such a circumstance, the losing state might issue a nuclear threat to try to coerce the recovery of the seized weapons. Whether such a threat would be followed through is difficult to assess. Most likely, a seized weapon or its crew would be used for propaganda and, subsequently, used as a bargaining chip in post-hostilities negotiations.

Nuclear Use Due to Miscalculation: False Alarm, Nuclear Accident, or Misreading the Other's Intention to Use

False alarms can exacerbate misperceptions and prompt hasty decisions, but much depends on the nature of the strategic environment – peace or crisis – prevalent at the time. The chances of a false alarm leading to a military crisis or nuclear accident triggering a nuclear use are less likely in

a peace environment than in a crisis or war. When regional tensions are not too high, even if relations are cold, existing communication structures (such as military hotlines or diplomatic communications) would activate to clarify the incident and prevent escalation.[16] Further, the "launch on warning" posture is not feasible in the India and Pakistani contexts, since flight times are extremely short. Following India's accidental launch of a Brahmos missile in March 2022, both sides acted responsibly and did not allow the incident turn into a crisis. Despite this, analysts are concerned as to what the outcome might be if such a scenario occurred during a crisis period, which occurs far too often between India and Pakistan.

Decisions in crisis or war are prone to worst-case assumptions. Misperceptions are likely to swell, especially when either country decides to try nuclear signalling to deter the adversary in a crisis. Thus far, South Asian crises have remained contained and have eventually de-escalated, but nuclear signalling in the past crises had the chances of over-interpretation and could have spiralled into unintended war.[17] In the 2001-02 crisis, Pakistan conducted missile flight tests at the peak of the India–Pakistan military standoff, when forces were deployed along the India-Pakistan border.[18] More recently, in the Pulwama-Balakot military crisis in February 2019, amid a tense political-military environment, while air-launched missiles were exchanged and air combat resulted in Pakistan shooting down an Indian aircraft, both sides perceived strategic weapons threats being signalled and/or arsenals alerted. Controversy remains over whether India deployed its nuclear-powered and nuclear-armed submarine—the INS *Arihant* – as a deterrent signal during the crisis.[19] Pakistan was seemingly unaware of the deployment of nuclear-armed naval assets at the time, but three years later, a flag rank officer from Pakistan's Strategic Plans Division wrote in a published article that "such actions could supplement pre-emptive first-strike temptations."[20] Post-crisis analyses suggest a potential for multi-domain escalation – both from conventional weapons to nuclear weapons and from the land to the

sea. Further, the advent of disruptive technologies may complicate future crises with cross-domain applications to include entanglement of nuclear and conventional delivery means.

Another complicating factor is the political rhetoric and blustering that are common in South Asia. Such public grandstanding during an evolving crisis could have escalatory consequences.[21] On balance, false alarms or accidents in normal peace-time are less likely to result in nuclear escalation, however, inadvertent deterrent breakdown amid an escalating military crisis and in the fog of war cannot be ruled out.[22]

Nuclear Use Following an Attack on National Command, Control and Communication (NC3)

A fourth potential for nuclear use could arise following a strike on the Nuclear Command, Control, and Communication (NC3) that cripples NCA control over nuclear weapons employment. By and large, though India and Pakistan maintain a non-deployed and non-alert status in peace-time, the transition from peace-time to a readied state in war or crisis is short, and increases the chances of inadvertent or accidental launch, as explained above.[23] However, India's development of sealed canister on launchers—which means warheads are permanently mated with missiles, and commissioning of two nuclear-powered ballistic missile submarines (SSBNs), the *Arihant* and *Arighat,* makes the non- deployed/ non- alert status questionable.[24] India and Pakistan are likely to have a "launch on orders" posture under the NCA's positive control of all arsenals, including TNWs and sea-based nuclear weapons.[25] The imperative to ensure the survivability of the NC3 systems – to include redundancies – is always crucial. In crises and wars, the NCA in both countries will face the inevitable never/always dilemma.[26]

A cyber attack on the NC3 could paralyse and possibly break down communication systems. Such a situation may create panic or tension, but it is not likely to result in immediate nuclear use. Redundancies

and alternative means of communication would be available to re-establish the NCA's control. Further, it takes time to determine the attribution of a cyber attack. In contrast, a physical attack, including the use of artificial intelligence-controlled targeting, on the NCA itself, destroying its command systems, would almost certainly cross a red line, potentially leading to a nuclear response. India and Pakistan have had a formal agreement prohibiting attacks on nuclear installations since 1988. However, they do not have any formal agreement not to attack each other's NC3 systems. Such a confidence-building measure could help ensure stability and responsible nuclear use control during crises and wars.

Less Probable Pathways

Several other pathways leading to nuclear use exist in theory but are tertiary or less likely in the case of India and Pakistan. Nuclear use to facilitate a conventional operational breakthrough is unlikely, as nuclear weapons would have little chance to offer any military advantage and would instead be counter-productive. Decision-makers would be cognisant that any form of nuclear use would guarantee a nuclear response in kind and rally the world against the country. Any nuclear use, regardless of target choices or intent, would transition a conventional war into the nuclear domain. One possibility short of a direct nuclear attack on military forces could be that a country decides to conduct a nuclear weapon test as a signal during a crisis. Another option could be a "demonstration shot" in a remote location as a means of diversion or warning.

The notion of a pre-emptive nuclear strike to gain advantage because of a belief that nuclear war is inevitable is also highly unlikely. Both India and Pakistan already have robust nuclear forces. Neither can eliminate the other's ability to strike back, and neither country would risk the survival of the subcontinent for uncertain gains. Some experts surmise that nuclear weapons deployed outside of peace-time secure storage regimes could be vulnerable to terrorist predators who could seize the

weapons and use them. Again, no possibility can be ruled out entirely, but such hypotheses are highly speculative. India and Pakistan consider their nuclear weapons capabilities as their crown jewels and keep them under strict security regimes.

Conclusion

Deterrence failure in South Asia is a terrifying possibility, with multiple pathways that could result in the unthinkable. The most probable pathway is an outbreak of conventional war wherein escalation control is lost, and de-escalation off-ramps are not taken. While a deliberate decision to employ nuclear weapons remains a last resort, it should be emphasised that the premise of Pakistan's nuclear capability is to never again suffer the spectre of military defeat, territorial loss, and humiliating surrender, as in 1971.[27] This rationale is at the heart of Pakistan's nuclear programme and remains so today. In any future war, Islamabad will not wait for India to inflict a decisive defeat; it will employ nuclear weapons if it determines thresholds are crossed.

In the 25 years since nuclear tests on the subcontinent and the resulting significant advancement in nuclear capabilities, India and Pakistan have not managed to get anywhere near détente or a stable relationship. Yet amid intermittent crises, both have had nuclear learning experiences. Despite the absence of any formal structural restraint agreement, both sides have managed escalation and maintained some form of deterrence, even without a shared vision of nuclear stability. Until both countries re-examine their respective security polices, address their doctrinal asymmetries, and reach a *modus vivendi* to develop a stable mutual deterrent relationship, the probability of nuclear use will remain an open question in South Asia.

Notes

1. In the 1950s, the Tibetan crisis and unsettled border disputes inherited from the erstwhile British India laid the foundation of China's relations with South Asia. At

the time, the two superpowers were seeking alliances and balancing in the region. John W Garver, *Protracted Contest: Sino-India Rivalry in the Twentieth Century* (Seattle: University of Washington Press, 2001), pp.32- 109; Andrew Small, *The China- Pakistan Axis: Asia's New Geopolitics* (London: Hurst and Co., 2015).

2. Feroz Hassan Khan, *Subcontinent Adrift: Strategic Futures of South Asia* (New York: Cambria Press, 2022), chs. I– XIII, pp.1- 56.
3. Major military crises, including short, localised high-intensity war, include Brass-tacks (1986-87), Kashmir (1990), Kargil (1999); Military Standoff (2001-02); Mumbai (2008); Uri (2016) Pulwama/Balakot (2019).
4. "*Pakistan Army Doctrine 2011: Comprehensive Response,*" AP 1001 E, 2011: 1.0 (General Headquarters, December 2011); Feroz Hassan Khan, "Deterrence Unsheathed: Pakistan and Prospects of Global No First Use "in Lieutenant General Prakash Menon and Aditya Ramanathan, eds., *The Sheathed Sword: From Nuclear Brink to No First Use* (New Delhi: Bloomsbury India, 2022), pp. 238-239.
5. Lieutenant General Khalid Kidwai (Retd), Advisor, Pakistan's National Command Authority (NCA) and former Director General Strategic Plans Division (SPD), Keynote address on February 6, 2020 at the Institute of Strategic Studies, London, https://www.iiss.org/events/2020/02/7th-iiss-and-ciss-south-asian-strategic-stability-workshop.
6. Peter R. Lavoy, "Islamabad's Nuclear Posture: Its Premises and Implementation," in Henry S. Sokolski, ed., *Pakistan's Nuclear Future: Worries Beyond War* (Carlyle Barracks: U.S Army War College (2008), p. 129.
7. Speech by Lieutenant General Khalid Kidwai (Retd), on 25th Youme-e-Takbeer, May 24, 2023. Delivered at the Institute of Strategic Studies, Islamabad. Available at: https://issi.org.pk/speech-by-lt-gen-retd-khalid-kidwai-advisor-national-command-authority-and-former-dg-spd-on-25th-youme-e-takbeer/.
8. Feroz Hassan Khan, "Going Tactical: Pakistan's Nuclear Posture and Implications for Stability", *Proliferation Papers*, No 53, September 2015 at https://www.ifri.org/sites/default/files/atoms/files/pp53khan_0.pdf.
9. On March 9, 2022, India accidentally launched a dual-capable Brahmos cruise missile that landed in Pakistan. Though analysts consider the incident as a historic first (an accidental launch from one nuclear armed state into another nuclear armed state), the crisis did not escalate primarily because it occurred during peace-time and did not hit any critical military or political infrastructure. The total flight time from launch to impact was 6 minutes and 46 seconds, out of which 3 minutes and 46 seconds were in Pakistan territory, 124 km inside Pakistan. For details, see Matt Korda, "Flying Under the Radar: A Missile Accident in South Asia", Federation

of American Scientists, at https://fas.org/publication/flying-under-the-radar-a-missile-accident-in-south-asia/.

10. Antoine Levesques, Desmond Brown, and John H. Gill, "Nuclear Deterrence and Stability in South Asia: Perceptions and Realities," International Institute of Strategic Studies, May 2021, p. 4.
11. Lawrence Rubin and Adam N Stulberg, eds., *The End of Strategic Stability? : Nuclear Weapons and The Challenges of Regional Rivalries* (Washington D.C.: Georgetown University Press, 2018), p.5.
12. See Walter C Ladwig III, "A Cold Start for Hot Wars? The Indian Army's New Limited War Doctrine," *International Security,* Vol. 32, Issue 3, Winter 2007/2008, pp. 158-190 at https://doi.org/10.1162/isec.2008.32.3.158.
13. External exploitation refers to abetment of the secessionist movement in the then East Pakistan that India exploited to invade, and create Bangladesh in 1971. In the present times, Pakistan alleges that external agencies support the separatist movement in Baluchistan and cross-border attacks from extremist groups such as the Tehreek – Taliban Pakistan (TTP) from sanctuaries in Afghanistan.
14. Lavoy, n.6, pp.129-139.
15. The Indian and Pakistani arsenals are not believed to be one-point safe, according to United States/Western standards. In the fog of war, or otherwise if nuclear weapons are targeted, it is likely as being perceived to be on purpose and not attributed to inadvertence.
16. India and Pakistan have agreed Director- General Military Operations (DGMO) hotlines in the respective Army Headquarters.
17. See Lieutenant General Deependra Singh Hooda, "Three Years After Balakot: Reckoning with Two Claims of Victory," *South Asian Voices,* Henry Stimson Center, February 28, 2022, at https://southasianvoices.org/three-years-after-balakot-reckoning-with-two-claims-of-victory/.
18. Ferox Hassan Khan, "Nuclear Signaling, Missiles, and Escalation Control in South Asia," in Michael Krepon, Rodney Jones and Zaid Haider, eds., *Escalation Control and Nuclear Option in South Asia* (Washington D.C: Henry L Stimson Center, 2004) at https://www.stimson.org/wp-content/files/file-attachments/Escalation%20Control%20FINAL_0.pdf.
19. Lora Saalman and Petr Topychkanov, "Reinvigorating South Asian Nuclear Transparency and Confidence Building Measures", *SIPRI Insights on Peace and Security,* No. 2021/4 September 2021 at https://www.sipri.org/sites/default/files/2021-12/sipriinsight2103_south_asian_nuclear_transparency_and_cbms.pdf.

20. Brigadier Imran Hassan, "Nuclear South Asia: Three Years After the February 2019 Kashmir Crisis", South Asian Voices, Henry Stimson Center, February 28, 2022, at https://southasianvoices.org/nuclear-south-asia-three-years-after-the-february-2019-kashmir-crisis/.
21. During the February 2019 crisis, a Pakistan Army spokesman announced that it had summoned the NCA, with a subtle hint in his remarks, "I hope you know what NCA means." In April 2022, Indian Prime Minister Modi, alluding to the Pakistani nuclear capability, remarked, "So what do we have? Are we saving them [nuclear weapons] for Diwali (Hindu festival)?" See Levesques, et al., n. 10, p. 13.
22. Sadia Tasleem, "Pakistan's View of Strategic Stability: A Struggle Between Theory and Practice," on Lawrence Rubin and Adam N Stulberg, eds., *The End of Strategic Stability? Nuclear Weapons and Challenges of Regional Rivalries* (Washington D.C: Georgetown University Press, 2018), pp.79-81.
23. In peace-time, warheads and delivery vehicles are believed to be stored separately. However, with canister-based systems and dual-capable systems, the ambiguity could lead to confusion over the deployment and alert status. See Feroz Hassan Khan, "Strategic Risk Management in Southern Asia," *Journal of Peace and Nuclear Disarmament*, Vol. 5, No. 2, October 2022, https://www.tandfonline.com/doi/full/10.1080/25751654.2022.2136878.
24. Hans M. Kristensen, Matt Korda, Eliana Johns and Mackenzie Knight, "Indian Nuclear Weapons, 2024", *Bulletin of the Atomic Scientists*, Vol. 80, No.5, 2024, pp.326-342,
25. Feroz Hassan Khan, "Nuclear Command, Control and Communications (NC3): The Case of Pakistan," Tech4GS Special Reports, September 26, 2019, https://www.tech4gs.org/nc3-systems-and-strategic-stability-a-globaloverview.html.
26. Christopher Clary, "Command and Control Challenges of New Nuclear Powers: The Case of Pakistan", Masters Thesis, Naval Postgraduate School, 2005, https://www.tandfonline.com/doi/abs/10.1080/10736700308436917; Peter D. Feaver, "Command and Control in Emerging Nuclear Nations," *International Security,* Vol. 17, No. 3, Winter 1992–93. Also see Feroz Hassan Khan, "Challenges to Nuclear Stability in South Asia," *The Nonproliferation Review,* Vol. 10, No. 1, Spring, 2003, 27. Feroz Hassan Khan, *Eating Grass: The Making of the Pakistani Bomb* (Stanford University Press, 2012), pp. 7-8, 68-92.

4. Possible Triggers to Nuclear Use: A Pakistani Perspective

Sitara Noor

In 2023, India and Pakistan marked the 25th anniversary of their nuclear tests. Since the overt nuclearisation in May 1998, both India and Pakistan have come a long way in advancing their nuclear weapons programmes and consolidating their respective nuclear policies. While the advent of nuclear weapons may have saved the region from a major war, it failed to bring stability between the two nuclear rivals as the proponents of the theory of a "nuclear revolution" suggested it would. As a result, various conflicts have been seen in the past 25 years, with the risk of escalation to the nuclear level. Contrary to initial concerns, both India and Pakistan have demonstrated relative restraint and caution in their nuclear signalling during these crises, but that restraint was not driven by a sense of morality or by the strength of the nuclear taboo—it was due to both states' mutual vulnerabilities. With growing instability in the region, there is a perennial risk of any future conflict leading to a nuclear war, advertently or inadvertently.

One would have hoped that the fear of mutual annihilation would lead to more engagement between the two states, leading to strategic stability. On the contrary, the region has become a nuclear flashpoint where recurrent crises have increased the risk of a nuclear exchange. At this juncture, it is important to take stock of the current situation, analyse future trends, and identify nuclear escalation pathways and potential triggers for nuclear use between India and Pakistan.

Before moving towards an analysis of potential triggers to nuclear use, it is important to identify some possible triggers to conflict or crisis. In the absence of any reliable risk reduction measures and crisis de-escalation mechanisms, except for reliance on third-party intervention, which had already exposed its limitation during the Pulwama/Balakot crisis, every crisis carries the risk of leading, by intention or mistake, to the nuclear level.

From the Twin Peaks crisis (2001-02) to the Pulwama/Balakot crisis (2019) all intervening crises have had a similar pattern; a terrorist attack allegedly orchestrated by Pakistan-based terrorist outfits on mainland India or Indian-held Kashmir. The Indian reactions have varied, depending on the severity of the incident. In the past few years, however, India has displayed a reduced tolerance and a higher degree of reaction with every passing incident. Therefore, the possible triggers of future crises need to be examined, as they will play a role in determining the trajectory of the crises, and understanding them may help design steps to reduce the chance that intense crises will occur.

Apart from the usual terrorism incidents, there could be other possible triggers that are not on the immediate radar but carry the risk of provoking crises in the future. Military incidents like the accidental launch of a missile from India in 2022 comprise one set of possibilities. Such an incident could likely receive a different and more aggressive response from Pakistan in the future with the potential to develop into a crisis. The response dynamics, meanwhile, would be altogether different if such an accidental launch were to take place in the midst of an already brewing crisis.

Secondly, as India's response to terrorism has evolved over the years, Pakistan has also become more vocal about alleged Indian-sponsored terrorism inside Pakistan in recent years. One cannot rule out the possibility of a crisis emerging as a result of a first move by Pakistan in response to a major terrorist incident inside Pakistan. Like India, the Pakistani leadership may also want to play the India card domestically in

the future and react more aggressively in response to any future alleged Indian involvement in terrorism activities.

Besides these military concerns, there can be some non-military reasons or actions that can contribute to bilateral tension, leading to a crisis such as South Asia's climate change vulnerability and its impact on bilateral relations. There is already a brewing diplomatic crisis over water issues. In the aftermath of the 2016 Uri attack, India threatened to revoke the Indus Waters Treaty as Prime Minister Narendra Modi declared that "blood and water cannot flow together." Last, but not least, one cannot ignore a crisis originating due to complete misinformation, such as a cyber or Artificial Intelligence (AI)-generated crisis.

Identifying Possible Triggers to Nuclear Use

A workshop convened to identify the pathways to nuclear escalation in Southern Asia, as part of the project Rethinking Nuclear Deterrence, discussed nine possible triggers to nuclear use between India and Pakistan. The nine possible triggers can be summarised in the following four categories.

- The first category of potential nuclear use largely covers a country's conventional edge/superiority during a war that may trigger the defeating country to use nuclear weapons: (1) to stop a conventional defeat; (2) to achieve a military breakthrough; (3) if facing destruction or seizure of its nuclear arsenal; or (4) as a last act of revenge if one's own side is being destroyed conventionally. Pakistan's nuclear policy is aimed at deterring India from using conventional force and at offsetting India's conventional superiority. In case of an imminent conventional defeat that can threaten the existence of Pakistan as a state, Pakistan would be likely to use nuclear weapons.
- The second category of potential nuclear use is when a country perceives an imminent threat of the use of nuclear weapons that may also trigger a "use it or lose it" dilemma. This category involves

two scenarios: (1) nuclear use based on the belief that nuclear war is inevitable and, hence, pre-emption could provide an advantage compared to not doing so; or (2) nuclear use due to a false alarm or a nuclear accident.

- The third category of nuclear triggers examines the potential nuclear use as a result of a miscalculation. This miscalculation may arise as a result of (1) the adversary's intention to launch; or (2) due to terrorist activities in the midst of a crisis, creating a fog of war. Besides that, there can be other miscalculations such as a country might miscalculate the adversary's nuclear red lines and mistakenly believe it can undertake certain actions without provoking a nuclear response. Similarly, a country might initiate nuclear use by miscalculating its control over the escalation ladder or ability to halt further nuclear escalation.
- The fourth category involves the use of nuclear weapons due to non-military reasons such as (1) distraction from domestic political issues; or (2) as a compulsion due to civil-military friction; the personality of leadership; religious factors, etc.

While all the triggers described in the four broad categories seem plausible, the degree of their relevance may vary at any given time in South Asia. It is possible that what seems highly unlikely today, may become a serious concern in the future and will require adding more scenarios or triggers to the list. For example, India's probable renunciation of the No First Use (NFU) policy and perceived infatuation with the pre-emptive nuclear counter-force strategy may require the addition of a bolt-from-the-blue trigger scenario in future studies.

Within the given list, an accidental launch as a result of some miscalculation seems to be the most likely scenario in South Asia whereas non-military reasons such as distraction from domestic political issues or civil-military friction seem least likely. In any case, it is unlikely that a singular event will trigger a nuclear use, any potential nuclear use in

South Asia will likely be at the intersection of one or two broad categories. Therefore, it is important to identify some specific scenarios that can potentially emerge out of one or more of these abstract categories. Given below is a list of some probable scenarios at the intersection of various categories described above, that may trigger a nuclear use.

Command and Control Vulnerabilities

Pakistan has established a synergised Nuclear Command, Control, and Communication (NC3) and Conventional Command and Control system (CC3) system for the management of nuclear weapons under the National Command Authority (NCA) of the Pakistani military. Preserving a strong and robust NC3 system is an important element of a country's nuclear policy, especially during a crisis.

Both India and Pakistan claim to have an assertive or centralised command and control system with a non-deployed and non-alert status of weapons during peace-time. The claims to have a non-deployed status are already under question with the introduction of sea-based nuclear assets by both India and Pakistan and India's pursuit of the canisterisation of ballistic missiles. Correspondingly, there are concerns about how assertive control is going to be maintained at sea. It is, therefore, possible that these assets will eventually have a pre-delegated launch authority, causing a greater risk of miscalculation and the potential of an inadvertent launch at a relatively early phase of the conflict.

Similarly, while there is some limited information available on the function of NC3 during peace-time, there is no clear information available with regard to the nuclear command and control's transition from peace-time to a war or crisis situations. Even if the entire inventory is under centralised control, it will have to shift from the peace-time mode to the war-time level.

Apart from the classic "vulnerability-invulnerability" paradox or the always/never dilemma with regard to battle effectiveness vs safety and security of the weapons there is a great chance of miscalculation

by the adversary during the transition phase as well. The timing of that transition is crucial and poses a greater chance of misinterpretation of the intent by the adversary. During a crisis, if centrally assertive control is delegated to the ground forces, the adversary may perceive that the delegation has happened even before the actual delegation, and might be faced with the choice of striking or losing the opportunity to do so; or worse, might encounter a "use it or lose it" dilemma. Likewise, if, in fact, India is moving away from its No First Use (NFU) posture and is working towards counter-force options, this gap between perceived and actual delegation may become a strong trigger for first use at an early stage of the crisis.

The Troubled Waters: Nuclear Risks in the Arabian Sea

Maritime risks are considered one of the enduring challenges in the South Asian security dynamics. Unlike the Cold War adversaries, India and Pakistan share sea borders, with short missile flight times, and face numerous challenges as a result of non-demarcated boundaries for submarine operations.

At the height of the Pulwama/Balakot crisis, India's fully operational ballistic missile-armed submarine (SSBN), the INS *Arihant*, was deployed and detected near Pakistan's exclusive zone. In the absence of robust communication channels to avoid misinterpretation of incidents at sea, the INS *Arihant's* deployment was a stark reminder that early deployment of sea-based assets in the middle of a crisis may add another layer of risk. Apart from the opening of another front during the crisis, the assessment of risks at sea brings back into focus issues concerning sea-based deterrence and the reliability of nuclear command and control at sea. Similarly, the placement of canisterised nuclear missiles on SSBNs during deterrent patrol missions may undermine effective civilian control, thereby increasing the risk of unauthorised or accidental launch of nuclear missiles.

India is substantially expanding its naval power with existing and planned capabilities such as aircraft carriers—both Russian and indigenous—new nuclear submarines, and destroyers, among other vessels. Pakistan is also expanding its naval footprint, although its plans are very limited in comparison. Given the troubling history of accidents at sea, especially involving submarines, there are legitimate safety and security concerns, which in a worst-case scenario, may escalate to a bigger crisis.

An oft-ignored yet very important potential trigger noted by Desmond Ball with regard to the US and former Soviet Union naval competition stems from the fact that the nuclear weapons at sea are less "visible" but "the sea is the only area where nuclear weapon platforms …actually come into physical contact." Thus, it increases the chance of an accidental collision, leading to a major unintended crisis. The series of accidents involving Indian submarines, notably the INS *Chakra* in 2017 and the INS *Arihant* accident reported in 2018, hint at poor safety culture onboard these vessels. In the absence of any joint mechanism to resolve issues at sea or any direct communication between two rival navies to avoid unintended escalation, such incidents can become a crisis trigger.

Moving into Uncharted Territories: Assessing the Impact of Disruptive Technologies

The South Asian region is well on its way to incorporating emerging technologies such as cyber capabilities, Artificial Intelligence (AI), and advanced space technologies into their offensive and defensive programmes. Although the level of their employment varies vastly between India and Pakistan, they have the potential to increase instability and enhance nuclear risks even at their nascent stage while both nuclear rivals tread these uncharted territories.

Technologies like AI and machine learning have the potential to minimise the role of the human element, thereby enabling faster decisions,

potentially further decreasing the time available for consideration and reflection. AI-enabled automation in decision-making, once fully achieved, is likely to affect the command and control systems and open unforeseen pathways to nuclear escalation – even if the final decision on launching nuclear weapons is never given over to machines. The limitations of ground-based human intelligence have already resulted in more reliance on technological sources, which has exacerbated the risk of miscalculation. The potential employment of lethal autonomous weapons in the future also points towards the growing risk of miscalculation and inadvertent escalation.

Similarly, AI-generated deep fakes and disinformation campaigns can initiate or deepen an evolving crisis. For example, Pakistan went into a status of high alert in the midst of the Mumbai crisis in 2008 when the then President of Pakistan Asif Ali Zardari received what turned out to be a hoax call from someone impersonating the Indian Minister of External Affairs Pranab Mukherji. Similarly, in 2016, Pakistan's defence minister threatened Israel in response to fake news about Israel threatening Pakistan with nuclear strikes.

Space and cyberspace have a central role in all military domains, including operations involving nuclear weapons. While they massively increase the capabilities of many systems, their potential vulnerability to hacking, spoofing, and data poisoning makes them an Achilles heel as well. Therefore, space and cyberspace vulnerabilities pose a serious risk to strategic stability, especially in developing countries such as India and Pakistan. India is ahead of Pakistan in their competition to achieve information superiority through advanced network-centric warfare capabilities. On the one hand, this superiority increases force asymmetry, but, on the other, it also opens up potential vulnerabilities and risks of escalation.

The advent of cyber warfare and anti-satellite weapons has also created cross-domain deterrence issues at the global level. Possible cross-domain responses have become a very problematic element in the South Asian

nuclear dynamics as well. Comingling of strategic and non-strategic weapon systems – for example, India's use of the SSBN *Arihant* for more non-strategic operations – is not just confusing but destabilising as well. The implications of non-nuclear strategic technologies with strategic effects such as cyber, hypersonic missiles, and other long-range weapons that can take out critical infrastructure pose enduring challenges to strategic stability.

Lastly, social media has become an important tool for information dissemination in this information age. But, at the same time, it can also turn out to be a huge source of misinformation and misrepresentation with huge consequences, especially during a crisis situation. Social media has already been recognised as a possible trigger of nuclear early warning systems in response to at least six reported incidents in the Asia-Pacific region between August 2017 and January 2018. Similarly, in South Asia, an escalation by tweets can become a reality where a tweet by the leadership during a crisis, originally intended for the domestic audience, can be misinterpreted as a warning or threat. It can add confusion to an already volatile situation and create escalation incentives for the adversary.

Evolving Role of the Third Parties

Historically, third-party intervention has served as a stabilising element in South Asian crisis management. Nonetheless, if the third party abandons its responsibility, without making both parties to the conflict fully aware that they are on their own, or sides with one party (in reality, or as perceived by the other party), it is likely to cause risky miscalculations. In every crisis in South Asia, from Kargil to Pulwama/Balakot, the United States has led the effort to diffuse tensions between India and Pakistan and pushed towards de-escalation. Nonetheless, the US' credibility as a neutral crisis manager came under debate during the Pulwama/Balakot crisis, when the United States was perceived to be favouring India. It is important to

note here that no country other than the US has the political clout, intelligence means, and leadership position to play that mediatory role. However, the United States' growing perceived tilt in India's favour is likely to become a problem for future crisis management. The competing parties' tendency to go down the nuclear brinkmanship path with the hope that the third party will intervene before the situation becomes out of control can cause miscalculation and, hence, become a nuclear trigger.

With growing US-China rivalry, on the one hand, and expanding strategic cooperation between the United States and India, on the other, Washington's traditional position as a reliable and neutral third party has been affected. Another associated challenge could be the involvement of additional or new third parties to fill the gap. The involvement of new parties who neither have sufficient leverage nor influence over the conflicting parties can further complicate the situation.

Conclusion

The evolving nature of the India-Pakistan rivalry portends an uncertain future where any small error and miscalculation can cause a nuclear disaster. In the absence of bilateral dialogue to resolve outstanding issues, including Kashmir and terrorism, the region is likely to face a continuous fear of purposeful or inadvertent nuclear war. The Pulwama/Balakot episode has demonstrated that there is a higher threshold for risk acceptance as it marked the first time since 1971 that India and Pakistan conducted airstrikes against each other. The crisis was terminated only by a chance offramp, where, following a dogfight, Pakistan captured the pilot of a downed Indian MiG-21 aircraft alive and subsequently returned him to India as a de-escalatory gesture. Such risk-tolerant behaviour in its own right adds another potential trigger for nuclear use.

Nuclear learning in South Asia has largely been based on the Cold War experiences. But unlike the United States and Soviet Union, India

and Pakistan have developed only very limited bilateral risk reduction measures, which exposes them to uncertain nuclear risks. In view of the grave consequences of inaction and growing risks to the region, it is imperative for India and Pakistan to adopt a policy of strategic restraint and work on crisis stability.

5. From Fog of War to Mushroom Clouds? Nuclear Use Scenarios in Southern Asia: A US Perspective

Frank O'Donnell

The China-India-Pakistan strategic complex is host to multiple sources of military and nuclear instability. Unresolved border disputes – along the India-Pakistan Line of Control (LoC), and the India-China Line of Actual Control (LAC) – combine with low policy-maker confidence that these challenges can be resolved through peaceful negotiation. Instead, strategic planners within the India-China and India-Pakistan dyads are reconciled to sustaining what some call an "ugly stability," through maintaining credible threats of military retaliation to any attempts by a rival to create new "facts on the ground" through armed border incursions.[1] Simultaneously, each of these states is experimenting with ambitious conventional limited war concepts that could threaten to cross adversary nuclear thresholds, while expanding and diversifying its own nuclear forces. These developments occur within a context of virtually no meaningful strategic or nuclear dialogue in the India-Pakistan and India-China dyads, elevating the risk of misperception and miscalculation of rival intentions, especially in a crisis. These trends only appear to reinforce the consistent conclusions over the last thirty years by Western officials and analysts that South Asia is one of the most likely sites for the world's first nuclear war.[2]

Recent Southern Asian crises and near-misses in 2022 alone included an accidental Indian launch of a cruise missile into Pakistan, and a Sino-Indian clash prompted by a Chinese attempt to militarily

seize strategic heights in Arunachal Pradesh. The latter incident followed a larger India-China skirmish in the spring of 2020, causing the first fatalities between the two powers in decades. Meanwhile, as part of its ongoing nuclear expansion and modernisation, China is reportedly placing some nuclear weapon systems on higher alert, and reducing the operational time requirement between a political order to launch a nuclear attack and the launch itself.[3] The Chinese state media has also referred to its nuclear weapons specifically in relation to the Ladakh standoff with India.[4]

In a near-war in 2019, India and Pakistan conducted airstrikes against each other, readied missiles, and made veiled references to their nuclear resolve. After this episode, a statement by India's defence minister was interpreted to have introduced a degree of public ambiguity around India's No First Use (NFU) doctrine, since he referred to the doctrine in the past tense.[5] Pakistan reaffirmed its first-use policy and advanced a "*quid pro quo plus*" concept, which emphasised its willingness to issue a disproportionate response to an Indian conventional attack.[6] As crisis outbreak and escalation in Southern Asia is likely to be increasingly "non-linear and unpredictable," it is crucial to evaluate the most likely causes of nuclear use in this context, and promote Confidence-Building Measures (CBMs) to avert these outcomes.[7]

This paper attempts to ascertain the most probable triggers of first nuclear use in Southern Asia as of the time of writing in summer 2024. It identifies four scenarios. First, a Pakistani single demonstration shot into the Arabian Sea, to prevent a war-time conventional defeat against Indian ground forces invading Pakistan. This invasion follows a major terrorist attack against India conducted by a Pakistan-hosted terrorist group. Second, a Pakistani strike against ground formations inside India supporting a more advanced stage of an Indian invasion, when Pakistan's leaders deem its territorial survival is on the brink. Third, a nuclear-armed Pakistani naval vessel defending itself against

perceived Indian Navy efforts to sink it, as part of a broader Indian operation interpreted as intending to blockade Karachi. Fourth, an Indian demonstration shot into the Bay of Bengal to reverse a successful Chinese operation to seize the Siliguri Corridor and forcibly separate Northeast India from the mainland. These scenarios are intended to be indicative of how strategic perceptions and misperceptions, emerging technologies, and poor crisis communication mechanisms can variably combine to disastrous effects in the region. The sequence in which the scenarios are discussed below does not convey any suggestion of their comparative likelihood.

This paper is structured as follows. I initially discuss each crisis scenario in some detail leading up to nuclear use. I next consider additional potential regional crises, and why these are less probable to lead to nuclear escalation at present. I conclude with recommendations for CBMs and strategic dialogues to diminish the principal conditions that may prove to be conducive to first nuclear use.

Table 1: Illustrative Nuclear Use Scenarios in Southern Asia, 2024

Scenario	Rivalry	Nuclear Use Trigger	Form of First Nuclear Use
1.	India-Pakistan	Pakistani war-time prevention of feared Indian conventional defeat	Single Pakistani demonstrative shot into the Arabian Sea
2.	India-Pakistan	Pakistani war-time prevention of feared total Indian defeat	Limited nuclear use against rival forces in Indian territory
3.	India-Pakistan and India-China dyads	India-Pakistan escalation against rival naval forces threatening nuclear-armed vessel; or similar Indian escalation against Chinese naval forces	Limited nuclear use against challenger naval forces
4.	India-China	Indian war-time prevention of intolerable Chinese territorial annexations	Single Indian demonstrative shot into Bay of Bengal

Scenario 1: Pakistani War-Time Prevention of Feared Indian Conventional Defeat

In this scenario, Pakistan could experience a rapid Indian ground advance into Pakistani territory, including breaking through Pakistan's major conventional formations close to the international border or LoC following a major terrorist attack by Pakistan-based militants against Indian military forces. New Delhi commences Indian airstrikes, conventional precision-guided missile operations, and cyber attacks to erode Pakistan's air and ground defences and military communications. This softens the ground for Indian Army formations to launch a campaign resembling the "Cold Start/proactive strategy operations" concept, intended to seize limited territory to hold for post-conflict negotiating leverage.[8] The surprise collapse of key Pakistani conventional defences – disproving previous strategic assessments that Pakistan enjoyed a conventional stalemate, if not a slight edge, against India – imposes severe pressures on Pakistan's leaders to evict the intruders and restore deterrence.[9] This shock effect is amplified by the images of Indian tanks crossing into Pakistan for the first time since the 1971 War, which led to the permanent separation of East Pakistan and its emergence as Bangladesh. Moreover, Pakistani decision-makers cannot determine the intent of this invasion – whether it is to end Pakistan's independent political existence [as some hawkish Bharatiya Janata Party (BJP) leaders and affiliated ideologues have urged],[10] or a punitive "Cold Start" operation.[11]

Pakistani leaders, cognisant of their country's lack of strategic depth, issue progressively less veiled nuclear warnings to deter India and catalyse U.S. intervention to end hostilities. In a supportive effort to compel Indian de-escalation, China announces it will commence a large military exercise close to the Ladakh clash areas with India, as in 2020. This would warn India that a two-front war could be imminent, while also aiming to weaken Indian operations by diverting forces from

Pakistan to shore up positions against China. However, Pakistani leaders might judge that this Chinese initiative may be too late in the context of the rapid advance of Indian forces, and, indeed, only accelerate India's plans so it can then pivot to meet the Chinese threat.

With its national survival increasingly at risk, a limited nuclear attack against India would push Pakistan towards its first-use doctrine and *quid-pro-quo-plus* policy. However, this might also trigger a range of Indian nuclear responses. If India held to its stated 2003 nuclear doctrine, it would retaliate massively, causing millions of Pakistani casualties through counter-value and counter-force attacks. However, even a departure from the doctrine and an Indian nuclear counter-force attack would remove most of the remaining Pakistani defences against India's military campaign, and generate immense casualties.

To thread this needle, Pakistan might select an option which former officials and strategists have discussed over the years: a demonstrative low-yield nuclear shot in a remote area.[12] Specifically, Pakistan would issue the NOTAM (Notices to Airmen) and NOTMAR (Notices to Mariners) to clear the designated missile flight path and the targeted Arabian Sea zone of other vessels, and launch a single nuclear ballistic missile from the Pakistani mainland to detonate at sea.

By not attacking Indian forces or territory, this demonstration shot would avoid the triggers for Indian nuclear retaliation under its 2003 nuclear doctrine. Moreover, it would not even overfly India, as opposed to the provocative recommendation by a former Pakistani Chief of General Staff that Islamabad conduct "a nuclear warning shot in the Bay of Bengal, across India, demonstrating our circular range capacity."[13] Still, this form of nuclear use, characterised by Morgan, et. al., as "suggestive escalation," might signal to India and international audiences how close the conflict was to nuclear war absent an Indian standdown, catalyse international pressure on India to cease its operations, and enable Pakistan to regain crisis escalation control.[14]

Scenario 2: Pakistani War-Time Prevention of Feared Total Indian Defeat

This next scenario for first nuclear use shares the same triggering conditions as the previous scenario. As India's operations continue, its perceived intention to militarily defeat Pakistan and leave it open to absorption or dismemberment is becoming the consensus assessment of policy-makers in Islamabad. Persistent Indian cyber attacks continue to prevent reliable Pakistani military visibility and communications, and, with it, a clear operational picture. The decision by Pakistani leaders to shut down civilian internet access to preserve bandwidth and avoid rumours propagating on social media only intensifies civilian panic. In India, the surprising military sweep of Pakistani forces – thus far – is cheered by the BJP-supporting strategic thought leaders, who frame it as a successful "calling of Pakistan's nuclear bluff," an appropriate retribution for decades of Pakistan-sponsored terrorist attacks on India, and a meaningful step toward the Hindu nationalist "Akhand Bharat" political-civilisational goal of uniting Pakistan, Afghanistan, and other neighbouring states and territories under Indian rule.[15]

Crucially, the worst consequences that India has suffered from the invasion have been from a turbulence in the economic market and public warnings from the United States, Quad partners, and China that India must immediately cease its operations, or risk international isolation. China has launched anti-India operations along their disputed LAC, but the Indian forces have been able to withstand or blunt these attacks, at least in the near term. The invasion of Pakistan is domestically popular in India, and reinforces the assumptions of the 90 percent of respondents to a recent Indian public opinion survey that India could militarily defeat Pakistan.[16] However, the minimal costs which India has borne thus far also reflect that this survey did not ask the respondents to consider how durable their support would be if Indian military requirements imposed material costs on Indian livelihoods.[17] The Modi government remains under strong domestic popular pressure to seize this opportunity to

defeat Pakistan. Pakistan's nuclear threats – including placing forces at enhanced readiness – have not deterred the Indian forces. The Indian leaders are insistent that any Pakistani nuclear strike on Indian forces or territory would trigger massive nuclear retaliation.

With Pakistan's leaders perceiving time to be running out for them to act as a cohesive state, they feel they must not only significantly punish India, but shock the United States and international community toward compelling Indian de-escalation and withdrawal. Toward that end, they launch a "defensive" nuclear response of at least three Ra'ad air-launched cruise missiles at Indian Army concentrations just inside India. While the Nasr tactical ballistic missiles could be an alternative vector for this mission, their limited range means they must be positioned closer to the Indian forces, and, therefore, at greater risk of Indian detection and destruction before launch.[18]

In refraining from conducting counter-value strikes, and instead selecting a limited counter-force mission, Pakistani leaders intend for this operation to end the crisis on Islamabad's terms. Their calculation is that this attack will create space for the combination of deterrence from the remaining Pakistani weapons and international pressure to dissuade India from massive nuclear retaliation, and for New Delhi to begin military disengagement talks.

Scenario 3: India-Pakistan Escalation Against Rival Naval Forces Threatening Nuclear-Armed Vessel; or Similar Indian Escalation Against Chinese Naval Forces

This case departs from the first two, in moving to the naval domain, where China, India, and Pakistan are fielding nuclear forces amidst contestation of maritime boundaries. The naval nuclear forces of these three states cannot launch nuclear weapons in the absence of a positive political order from the civilian authorities.[19] Still, China has employed coercive naval strategies against India, and such episodes are also common within the India-Pakistan dyad. These incidents

have included brinkmanship tactics.[20] Importantly, the advent of naval nuclear deterrence in Southern Asia has not led to a review of these approaches in the light of the growing risks of inadvertent nuclear escalation that they bear.

During the 2019 Pulwama-Balakot crisis, for example, the Indian Navy was tasked with locating all Pakistan Navy vessels to prepare for their potential elimination. This mission involved a 21-day hunt for the PNS *Saad* submarine, which may be assigned nuclear missions in the future. Regardless of its potential nuclear status, the Indian Navy instructions were that "all necessary actions were to be taken to force it to come on the surface, and if required take military punitive action against it."[21] Pakistan's future nuclear force is likely to comprise cruise missiles carried aboard a mix of surface boats and Chinese-origin *Hangor*-class diesel-electric submarines.[22] These vessel classes will be dual-use, complicating Indian naval planners' task of determining whether a Pakistani vessel is carrying nuclear weapons.

These risks are further elevated by the propensity of Pakistani naval commanders to pursue brinkmanship tactics, alongside the similar persistence of Indian efforts to locate and, if necessary, pressure Pakistan Navy vessels. The danger of a seaborne nuclear launch in a crisis is only heightened when we consider that Indian and Pakistani national nuclear commands are more likely in a deep crisis to order that their designated naval forces be armed with nuclear weapons and deployed, as the same political leaders might simultaneously order more aggressive naval manoeuvres to protect their maritime boundaries. Pakistan's smaller navy vis-à-vis India, and Islamabad's persistent concern with an Indian Navy blockade of Karachi in a conflict, could especially amplify these dynamics in an Indian operation against a Pakistani nuclear-armed vessel. While India probably does not field its SSBNs in the Arabian Sea, and Pakistan is unable to similarly blockade India's commercial ports, the risk of an Indian SSBN facing similar dilemmas imposed by the Pakistan Navy also cannot be dismissed.[23]

China is unlikely to deploy its SSBNs into the Bay of Bengal or the Arabian Sea in the near term, and, instead, may broaden its patrols out to the South China Sea.[24] However, the growing general People's Liberation Army Navy (PLAN) presence in the Indian Ocean – including near Indian bases – could lead to similar pressures on Indian nuclear-armed submarines. The PLAN could perceive these Indian SSBNs as being conventionally-armed submarines and legitimate targets for harassment. The converging pressures facing an Indian nuclear-armed submarine in this contingency – potentially including an external communications cutoff, gradual encroachment by undersea drones, and evidence that the vessel is being surrounded by hostile forces in preparation for a possible strike – would place immense pressures on not only its crew, but on the civilian decision-makers. If these same decision-makers were engaged in a broader war with the state targeting its naval nuclear vessel, they may feel that this incident presents an opportunity to demonstrate that its threshold has been crossed.

Scenario 4: Indian War-Time Reversal due to Chinese Territorial Annexations

The final illustrative scenario involves the India-China dyad, as its competition plays out across the LAC. Indian officials and experts have especially highlighted the vulnerability of the Siliguri Corridor, a narrow strip of land connecting the Indian mainland with its northeastern states. Potential Chinese operations could sever this link, or alternately, achieve an advantageous military position for Beijing that enables this outcome at a time of its choosing; the latter would bear a better Chinese cost-benefit ratio.[25]

Nevertheless, Beijing could be emboldened by the Indian official reaction to the 2020 People's Liberation Army (PLA) Ladakh incursions. New Delhi has preferred to tacitly accept the territorial loss; bolster military forces in adjacent areas to inhibit further Chinese adventurism; and publicly justify the absence of Indian conventional military escalation

to retrieve the territory by referring to China's larger economic and military capabilities.[26] A robust PLA move into the Siliguri Corridor itself would also divert Indian strategic attention away from addressing the Chinese threats in the Indian Ocean, South China Sea, and further east, undermining the US-led coalition of Indo-Pacific partners resisting Chinese belligerence in these areas.

Should China choose to militarily occupy the Siliguri Corridor, however, and Indian conventional forces are unable to dislodge them, New Delhi might then plan conventional missile strikes against Chinese bases and military supply lines in Tibet.[27] If these attacks do not compel Chinese de-escalation and negotiated withdrawal from the Siliguri Corridor, New Delhi might find itself facing an exceptionally difficult choice: accept the *de facto* division of India, or escalate to the next, nuclear, level. This specific scenario has been highlighted by Indian and international analysts as a key pressure point on India's NFU doctrine.[28] Should it choose escalation, India could first announce that it is rescinding its no-first-use policy toward China.[29] If this fails to alter the Chinese behaviour, New Delhi might then select a demonstrative shot into the Bay of Bengal, following the same strategic logic and prior NOTAM and NOTMAR warnings as Pakistan under the first scenario. Such an operation could potentially force China to withdraw from a conflict in which it always had far less at stake than India, while sparing India from Chinese nuclear retaliation. The latter might be more likely if, instead of the demonstrative shot, India had instead struck Chinese military positions inside Tibet.

Escalation Roads Not Taken…For Now

Other nuclear escalation risks in the general literature include those placing greater emphasis on emerging technology dynamics, such as miscalculation due to AI-informed decision-making, extended cyber attacks to conduct a "non-contact" strike on adversary nuclear forces and command and control systems, and saturation conventional counter-

force precision-strike operations, among others. However, integration of AI into the Southern Asian nuclear planning is – at the most – very nascent.[30] Moreover, each national nuclear command system prioritises a human political leader issuing a nuclear strike order.[31]

Conventional counter-force operations may also be employed, especially as an option for Indian forces against Pakistani nuclear targets in a deep crisis.[32] However, it is more probable that Pakistani nuclear use will be triggered by the actual presence of advancing Indian forces within Pakistan. Indian conventional counter-force attacks are unlikely to be a potential trigger if they are not part of a broader military campaign threatening Pakistan's territorial integrity.

Conclusion

In reflecting on these three scenarios of a Southern Asian crisis leading to nuclear escalation, the most important step that should be taken by Beijing, Islamabad, and New Delhi to reduce the risk of nuclear use is initiating a Track I strategic dialogue. This dialogue should incorporate mutual nuclear and conventional threat perceptions stemming from doctrines, deployments, and posturing plans, to lessen the danger of miscalculation of rival intentions in a crisis, while building strategic trust. Such a dialogue should include naval nuclear issues, and ultimately have a goal of producing an agreement or set of understandings around how to de-escalate a clash involving a nuclear-armed vessel. Recognising the role that emerging technology factors play in the first two scenarios, banning the use of AI and cyber attacks against nuclear command and control systems and their constituent sensory and communications networks would be another valuable outcome. Depending upon the levels of political will, this dialogue could be conducted via back channels, and on a dyadic India-China and India-Pakistan basis rather than as a trilateral process.

An attack by Pakistan-hosted anti-India terrorist groups remains a prominent likely trigger of an escalation sequence which results in

nuclear use between the two states. Steps by Pakistan to permanently dismantle these groups on its territory, following its recent success in this direction, leading to its removal from the Financial Action Task Force (FATF) grey list, could reduce this danger.[33] India should adopt a deterrence-by-denial posture against Pakistan, and cease Cold Start-like conceptual planning that elevates Pakistan's strategic threat perceptions. Moreover, the Modi government should clarify that the "Akhand Bharat" notion has no constituency among its leaders, and publicly discipline BJP and Rashtriya Swayamsevak Sangh (RSS) officials who continue to propagate it. Islamabad and New Delhi should recognise the escalation dangers of a repeat of the 2019 Pulwama-Balakot crisis, and move away from a military-first approach to their relationship.

Finally, continuing efforts by China to seize Indian territory along the LAC could intensify Indian debates about the efficacy of nuclear signalling, or revising its NFU doctrine against China to compensate for perceived conventional asymmetries. The withdrawal of China's forces to the pre-2020 status quo, and initiation of the above strategic dialogue with India, would strongly dilute a key driver of regional instability. Without a significant effort from the Southern Asian states to address the contemporary probable causes of nuclear use, they risk heightening its likelihood.

Notes

1. While the term "ugly stability" tends to be used to describe the India-Pakistan dyad, it is increasingly applicable to the India-China rivalry. See Feroz Hassan Khan, *Subcontinent Adrift: Strategic Futures of South Asia* (Amherst, NY: Cambria Press, 2022), p. 217; and Ashley J. Tellis, *Striking Asymmetries: Nuclear Transitions in Southern Asia* (Washington DC: Carnegie Endowment for International Peace, 2022), p. 234.
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This monograph explores and examines plausible nuclear escalation pathways in the two adversarial nuclear dyads in Southern Asia. Three nuclear-armed states sit geographically next to each other in this region. India sits in the middle and has troubled relations with both Pakistan and China, nuclear-armed neighbours on either side. Territorial disputes, unsettled borders and the not-so-infrequent cross-border terrorism create ample scope for crises. Regional volatility is also being exacerbated today by hot wars, with nuclear overtones, between Russia and Ukraine and in the Middle East; the existence of multiple nuclear dyads creating trans-regional tensions owing to nuclear modernisation; increasingly hostile relations among major nuclear-armed states; evolving technologies that may increase nuclear risks; doctrines that suggest increased reliance on nuclear weapons; states that seem to believe that creating nuclear risks is useful for deterrence; and a general permissiveness in favour of the use of force. Each of these conditions, individually or collectively, could create pathways to a nuclear war. The authors of this publication provide their individual sense of what could be the most dangerous pathway by which a nuclear war might start, and how it might vary from one set of potential nuclear adversaries to another. They also examine factors that might be critical in increasing or decreasing the risk of a nuclear conflict, such as the characteristics of nuclear forces and policies (alert levels, dual-use systems, doctrines on when and how nuclear weapons would be used, etc.), and evolving technologies influencing strategic balances and the risk of nuclear conflict. They also offer suggestions on what the nuclear armed countries could do along each of the pathways to reduce these risks in Southern Asia.

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