Nuclear Deterrence and Stability in South Asia: Perceptions and Realities

Antoine Levesques, IISS Research Fellow for South Asia

with

Desmond Bowen, IISS Associate Fellow for South Asia
John H. Gill, IISS Associate Fellow for South Asia

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Cover
Left: Pakistan conducts the training launch of a short-range Hatf-9 Nasr missile, 24 January 2019 (Inter-Services Public Relations, Pakistan); Right: India conducts the flight test of a B-05/K-15 underwater-launched ballistic missile, undated (Getty).
Glossary

ASAT  Anti-satellite
BMD  Ballistic-missile defence
CBMs  Confidence-building measures
FSD  Full-spectrum deterrence
IAEA  International Atomic Energy Agency
ISPR  Inter-Services Public Relations (Government of Pakistan)
LoC  Line of Control
NCA  National Command Authority (Government of Pakistan)
NFU  No first use
NSAB  National Security Advisory Board (Government of India)
SPD  Strategic Plans Division (Government of Pakistan)
SSBN  Nuclear-powered ballistic-missile submarine
Executive summary

This IISS primer examines nuclear deterrence and stability in South Asia by separating perceptions from facts in order to assess the extent to which India and Pakistan may be at risk from imprudent or mistaken use of nuclear weapons.

The authors start from an uncomfortable truth: chance played an important ameliorative role in the February 2019 India–Pakistan security crisis.

India and Pakistan risk stumbling into using their nuclear weapons through miscalculation or misinterpretation in a future crisis.

This primer presents evidence suggesting grave deficiencies and asymmetries in India’s and Pakistan’s nuclear doctrines, which are compounded by mutual disbelief, existing and emerging military capabilities, and the prolonged absence of related dialogue mechanisms.

India and Pakistan are seeking new technologies and capabilities that dangerously undermine each other’s defence under the nuclear threshold. Whatever they learn from past crises, the uncharted territory they are now exploring requires enlightened judgement about their doctrines, their nuclear and conventional capabilities, and their unpredictable implications in future crises.

India and Pakistan already possess sufficient nuclear weapons to ensure a robust, largely stable mutual nuclear deterrence. Nuclear expansion casts doubt on stated policies of minimalism, risks a high-cost arms race in the post-pandemic era and may put overall deterrence stability at risk.

China’s evolving profile as a nuclear-weapons state is compounding India’s security challenges. Yet control over the drivers of the India–Pakistan nuclear-deterrence and stability equation remains almost entirely in the hands of leaders in New Delhi and Islamabad.

Only India and Pakistan can choose to creatively overcome the challenges to adopting new risk-reduction measures, as an imperfect but realistic stopgap until trust-building and eventual political dialogue make arms control possible.

This primer identifies a list of potentially useful confidence-building measures (CBMs) and other practical steps both countries could take early on.

It concludes that a robust, trusted, reliable, deniable backchannel between their leaderships is the most promising means by which India and Pakistan could achieve greater strategic and nuclear-deterrence stability. This is in their interests and operationalising it is their decision. Such a mechanism should help avoid or mitigate the costs of any future crisis as well as eventually help India and Pakistan to adopt new CBMs on the way to building greater trust.
Introduction

This study seeks to separate realities from misperceptions about India’s and Pakistan’s respective nuclear-weapons capabilities, policies and doctrines. It is intended as a primer on each country’s nuclear profile and offers recommendations for reducing the risks associated with the presence of nuclear weapons in South Asia.

Any failure of deterrence leading to a confrontation between India and Pakistan could result in the first offensive use of a nuclear weapon since 1945 and potentially escalate into a broader nuclear exchange. Neither side would truly win such a war, the consequences of which, including the breakdown of the nuclear taboo that has held for more than 70 years, would extend far beyond the region. Unless national survival were truly at stake, it is hard to see what security gains would warrant nuclear use. India and Pakistan became nuclear-armed states when they both tested weapons in 1998.

In February 2019, the worst security crisis between India and Pakistan in a generation was a sobering reminder of what is at stake. On 14 February, a suicide-bomb attack – for which the Pakistan-based JeM terrorist group claimed responsibility – killed 40 Indian paramilitary personnel in Pulwama in the Indian state of Jammu and Kashmir. In retaliation, India carried out an airstrike targeting what the Indian government described as a major JeM training camp in Balakot, a town in the Khyber Pakhtunkhwa province of mainland Pakistan. Pakistan’s counter-retaliation resulted in the loss of an Indian aircraft and the capture of its pilot. (He was later released.) There are reports that India threatened to use, and possibly prepared, a small number of conventionally armed ballistic missiles against Pakistan. During the crisis, both sides engaged in deterrence signalling that alternated between provocation and restraint, and which was evidently clouded by misperceptions that could have led to miscalculation and unintended escalation. This episode, in which chance played an ameliorative role, challenged both countries’ long-standing claims of being able to contain a crisis well ahead of any resort to nuclear weapons. Such claims have been, at best, soliloquies, rather than resulting from dialogue between the two.

The odds of deterrence failure in South Asia are higher than might be assumed based on the modest amount of public debate the issue receives both within and outside South Asia. Relevant developments often move slowly and only briefly catch media attention, but in the long run produce significant cumulative effects. The publication of this primer has been timed to coincide with the somewhat lower state of tensions since 2019, which was marked by both the Pulwama–Balakot crisis and New Delhi’s decision to change the status of Indian-administered Kashmir. Depending on its longer-term economic implications for India and Pakistan, the COVID-19 crisis can be expected at best to freeze or merely slow down the trends described in this report. Its contents can contribute to informed decision-making, planning and debate by each country’s government well before they enter their next electoral cycle in 2023–24. Following the worst of the pandemic and the resumption of in-person top-level diplomacy, prime ministers Imran Khan and Narendra Modi will have opportunities to hold substantive conversations on the sidelines of multilateral conferences. India’s first hosting of a G20 heads-of-government summit in 2023 could take place in conducive regional conditions if India and Pakistan adopt new risk-reduction measures. This summit will be India’s highest-profile multilateral diplomatic event during Modi’s second term.
The IISS has a long track record of monitoring the drivers of nuclear-weapons-related instability in South Asia with a view to informing policymakers both within the region and beyond. IISS publications and the Institute’s long-standing practice of convening meetings of stakeholders in regional statecraft have kept a steady focus on South Asia. The IISS has also offered many opportunities for India’s and Pakistan’s most influential defence intellectuals to share informed perspectives on nuclear matters. This primer therefore draws on more than just text-based open sources. The authors’ decade-plus experience of engagement with senior officials and experts on defence and strategic issues from both India and Pakistan intervenes when public evidence is incomplete or contradictory. They hope this approach will make the analysis convincing to officials in the region, including those who have a stake in the issues without being at the heart of the most secret decision-making.

This primer presents an assessment of the challenges to nuclear deterrence and stability in South Asia. To retain focus, it does not consider trends and crises involving nuclear weapons in other regions; past and present proliferation crises and their effects on the region; the details of crisis-escalation dynamics before nuclear use occurs; China’s role in shaping the India–Pakistan nuclear relationship; global nuclear diplomacy; or the socialisation (or ‘normalisation’) of India and Pakistan as de facto nuclear-weapons states outside the Non-Proliferation Treaty (NPT). The authors do, however, draw insight and caution from the growing body of Cold War scholarship, including that related to crisis management and arms control, as well as from the professional experience of latter-day ‘cold warriors’. This community of former officials with experience of the workings of nuclear deterrence during the Cold War includes two of the primer’s authors.

There is no expectation that everyone – especially those in South Asia – will share the assumptions, scope or conclusions of this report, which partly concentrates on risk reduction. Pragmatism drives the authors to the following assumptions:

- India and Pakistan have suffered a diplomatic lost decade since the Mumbai terrorist attacks in November 2008 killed more than 166 people. Missed opportunities for diplomatic engagement have added to the unresolved differences, irritants and broken promises between the two sides, thus preventing the political normalisation of their relationship. The progressive restriction of formal, informal and backchannel communications for the prevention, management and resolution of cross-border problems and crises has negatively affected the region’s strategic stability.

- Since 2008, precious few low- or high-level diplomatic or para-diplomatic initiatives by third parties seem to have convinced India and Pakistan that the focus of their national nuclear complexes should be on lowering the risk of deterrence failure. Calls for global disarmament by the Global Zero campaign and by former US president Barack Obama had no more practical impact on India’s and Pakistan’s arsenals than they did on those of other countries. Major powers outside the region are more distracted in 2021 than they were in 2008, let alone earlier in that decade (when some progress towards conflict resolution was recorded between India and Pakistan).

- A strong case can be made that India and Pakistan can overcome perceptions that their disputes are intractable and insurmountable. But this will require both countries to give careful thought to what is truly in their long-term national interest, beyond short-term political expediency. They should also consider the ways in which nuclear weapons can both contribute to and undermine that national interest, including to the point of national extinction.
Notes

1 Although estimates of losses vary with number of weapons used, weapon yields, height of burst and other local factors, the scale of millions of dead and injured in any exchange that goes beyond a warning shot remains consistent. A detailed 2019 study by a group of independent scientists and experts estimated that, depending on the weapon yields, between 55 million and 125 million people would be killed if India and Pakistan launched 100 and 150 weapons respectively at one another’s cities or at military targets near cities. There would also be dramatic effects lasting decades on regional and global food supplies (aside from illness, pollution and poisoned land). Earlier assessments concluded that several million people would be killed outright on each side and several million more would suffer serious injuries even if far fewer warheads were employed. Neither country has the capacity to cope with human casualties on this scale, especially as the loss of life would be compounded by enormous damage to infrastructure and institutions. The resources of the entire global community would be insufficient to mitigate the scope of the human loss and material damage. Beyond the immediate region, the 2019 study noted that the ash cloud resulting from a serious India–Pakistan nuclear exchange would have global effects, lowering planetary temperatures enough to cause widespread crop failure and mass starvation across the world. See ‘The Climatic Consequences of a Limited Nuclear War’, in Strategic Survey 2019 (Abingdon: Routledge for the IISS, 2019), pp. 45–54; Jonas Jägermeyr et al., ‘A regional nuclear conflict would compromise global food security’, Proceedings of the National Academy of Sciences of the United States of America, vol. 117, no. 13, 16 March 2020, pp. 7071–81, https://www.pnas.org/content/117/13/7071; Owen B. Toon et al., ‘Rapidly Expanding Nuclear Arsenals in Pakistan and India Portend Regional and Global Catastrophe’, Science Advances, vol. 5, no. 10, 2 October 2019, https://advances.sciencemag.org/content/s10-eeay5478; for earlier estimates, see Thom Shanker, ‘12 Million Could Die at Once in an India–Pakistan Nuclear War’, New York Times, 27 May 2002, https://www.nytimes.com/2002/05/27/world/12-million-could-die-at-once-in-an-india-pakistan-nuclear-war.html; Matthew McKinzie et al., ‘The Risks and Consequences of Nuclear War in South Asia’, in Smriti Kothari and Zia Mian (eds), Out of the Nuclear Shadow (New Delhi and London: Lokayan and Rainbow Publishers, and Zed Books, 2001); Executive Summary of a simulation sponsored by the US Naval War College, 28–30 January 1999; Bradd C. Hayes, ‘International Game ‘99: Crisis in South Asia’, Homeland Security Digital Library, https://www.hsdl.org/?abstract&did=452968; and Paul D. Taylor, ‘India and Pakistan’, Naval War College Review, vol. 54, no. 3, Summer 2001, https://digital-commons.usnwc.edu/nwc-review/vol54/iss3/4/.


4 The episode featured two fortuitous aspects: the Indian fighter pilot who was shot down made a safe landing on the Pakistani side, allowing Pakistan to make a conciliatory gesture by returning him safely. Secondly, Pakistan’s counterstrike hit near a major Indian military target but did not cause any significant damage or loss of life.

5 Although significant armed violence persists on the India–Pakistan border, see data in ‘Changes in Jammu and Kashmir:

6 This is despite Pakistan not being part of the G20 and thus not attending the meeting. Shorter term, there is speculation that Modi could travel to Pakistan to attend a summit of the South Asian Association for Regional Cooperation (SAARC) countries in October 2021.


9 Hayes, ‘International Game ‘99’.
1. Understanding doctrine and deterrence

All nuclear-armed states face the challenge of devising a nuclear doctrine. This is a statement by an authoritative government source, in written or oral form, presenting a policy on the state’s intent regarding the potential employment of nuclear weapons, directed mainly at potential adversaries. Such statements are an indicator of strategic thinking and provide a sense of the politico-military behaviour a state might display in a crisis. The armed forces of states with nuclear doctrines also adopt statements charting their behaviour towards other state and non-state actors.

For example, doctrine may indicate whether a state would seek to target the other side’s military forces in a counterforce (against its military) or counter-value (against its cities and civilians) strike. Doctrine can also express a state’s preferences concerning ‘first use’ (being the first of two adversaries to use a nuclear weapon in response to unbearable military losses), ‘no first use’ (NFU—using nuclear weapons only in retaliation to the adversary’s first use) and ‘second strike’ (retaining enough nuclear weapons to strike back after being struck). Doctrines often use descriptions of the scale (how big) and scope (how far) of the military effect sought, ranging from the largest and widest to the narrowest and smallest (‘strategic’, ‘operational’, ‘tactical’). These levels of analysis are in fact codependent and hard to separate in conventional conflict, let alone if a nuclear war were ever fought, in which any nuclear use would have strategic effect.

Publicly stated doctrines are unlikely to be comprehensive or complete. The Cold War demonstrated that ambiguity is an essential part of deterrence, and states can be expected to keep many secrets in the military domain. Nor is it possible to spell out the precise circumstances of any future crisis or contingency. Of course, a doctrine could be little more than an elaborate deception, but to sustain such an approach would be difficult and possibly counterproductive. A doctrine may not be binding on the government that issues it, but it is a public statement against which a state might be judged, both nationally and internationally. Predictability is a valued commodity in international relations, particularly where there is a risk of state-on-state violence. Doctrine, therefore, carries weight and should be treated with respect.

1.1 The utility of nuclear doctrine

As a political declaration of intent directed mainly at potential adversaries, a doctrine plays a key role in establishing a country’s overall deterrence posture. By conveying a threat of possible nuclear use, nuclear doctrine in particular can serve – along with a country’s physical capabilities and military preparedness – to dissuade an adversary from aggression. The prime objective of nuclear deterrence is to influence the calculation by the adversary’s leadership that if it were to undertake aggression, the act would not succeed or go unpunished.

A second purpose of nuclear doctrine is to demonstrate to the public that the government is committed to safeguarding national security, and to provide guidance to the civil and military public officials who would be expected to act in the event of a crisis. Wide-ranging political support for a doctrine can strengthen its validity, although a state should guard against fostering unrealistic public expectations that could lead to brinkmanship. Domestic opposition (separate from oversight), on the other hand, can have an undermining effect. Nuclear doctrine can provide a point of focus for discussions in the national political class and civil society about the costs and benefits of nuclear weapons.
The final purpose of nuclear doctrine is to shape the way a state is perceived by other countries, most of which will not possess nuclear weapons themselves. Whether a nuclear-weapons state is seen as responsible will be at least partly determined by how it presents itself in its nuclear doctrine. The destructive capacity of nuclear weapons is such that the states possessing them bear a special responsibility to carefully consider where, when and how they might be used.

There are no objective or internationally accepted criteria by which to judge nuclear doctrine. Nor is it possible to rate the effectiveness of a doctrine other than by the absence of war, up to the point at which doctrine fails and war breaks out. It is possible, however, to consider the risks a doctrine entails – particularly in relation to that of an adversary – and the possible misjudgements and misperceptions that could arise, with potentially dire consequences for both sides. This is the purpose of the following chapters of this study.

1.2 The nuclear taboo
Because of their exceptional ability to inflict widespread damage and cause mass casualties, nuclear weapons are placed in a separate category from conventional arms by both political leaders and the public. That has been the case ever since nuclear weapons were invented and used for the first (and only) time during the Second World War.

Since two nuclear bombs were dropped on Japan in 1945, a taboo, especially among national political leaders and the public. That has been the case ever since nuclear weapons were invented and used for the first (and only) time during the Second World War.

One aspect of this thinking is the prospect of the destructive power of nuclear weapons used in retaliation inflicting ‘unacceptable damage’ on the aggressor. Exactly what would constitute unacceptable damage is, however, open to interpretation and subject to many variables. Unlike during the early phase of the Cold War, today the threat of unacceptable damage may not necessarily imply the total destruction of a society. There may now be degrees of unacceptability. Those may involve solely targeting command-and-control centres and other sites of national importance in a debilitating attack. Even so, the notion suggests that the functioning of the state would be impaired to such a degree that its will (and probably its capacity) to continue the conflict would have been eviscerated.

The role of the potential infliction of unacceptable damage in nuclear deterrence carries two implications. Firstly, only the most extreme adversity can justify a state in resorting to unacceptable damage, for example where the continued existence of the state or its vital interests is in doubt. The other implication is to provide
a guide to judge the optimal size and sophistication of a nuclear arsenal: once two nuclear-armed states have the weapons to deliver unacceptable damage to one another in a second strike, deterrence should remain effective. Acquiring more or better nuclear weapons may not be necessary since it would exceed the requirement. Such measuring against sufficiency can help interpret the notions of minimalism and credibility, which are commonplace in nuclear doctrines.

1.3 Strategic stability and nuclear weapons
Where nuclear weapons are present and unlikely to be removed, military planners and policymakers may seek to achieve ‘strategic stability’ (see Figure 1). The term refers to a situation in which a kind of equilibrium exists between two or more states such that none of them feels at a significant disadvantage. Strategic stability derives both from evidence of a physical military capacity and from an assessment of associated political resolve. During the Cold War, strategic stability was largely a function of how unlikely it was that surprise attacks could occur between the United States and the Soviet Union.

More narrowly, the question of ‘crisis stability’ arises in circumstances when one of two adversaries is under pressure to act militarily. Crisis stability refers to the factors influencing the balance between those two opponents in, and their ability to retain control over, a crisis. During the Cold War, minimising brinkmanship was a central feature of crisis stability under the nuclear threshold. That effort staved off nuclear war. But this did not follow from simple mechanistic power relations. Conventional forces, by contributing to ‘conventional deterrence stability’, are an essential part of overall deterrence and strategic stability (see Chapter Three). Strong conventional forces help to avoid placing undue reliance on the early use of nuclear weapons, either for full strategic effect or anything short of this to achieve so-called ‘war termination’. Minimising risks to crisis stability requires level thinking about trade-offs and pathways for both escalation and de-escalation: those must account for how confusion (‘fog’), friction or biases can affect notions of self-worth or injured national pride and create ‘compulsions’ or ‘commitment traps’ to ‘appear tough’ and ‘settle scores’, as officials in private or press commentary sometimes put it.

Figure 1. Indicative components of strategic stability

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<tr>
<td>DETERRENCE STABILITY</td>
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<td>NUCLEAR DETERRENCE STABILITY</td>
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<td>CONVENTIONAL DETERRENCE STABILITY</td>
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<td>SUB-COMVENTIONAL DETERRENCE STABILITY</td>
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<tr>
<td>CRISIS STABILITY</td>
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<td>ARMS-RACE STABILITY</td>
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Source: IISS
'Arms-race stability', another notion within strategic stability, refers to the factors that determine how states’ accumulation of military capabilities can contribute to achieving or disrupting a sense of balance between them.

Strategic stability is neither a naturally occurring nor an irreversible condition. The inevitable imbalances and uncertainties in any relationship mean that instability is more likely, especially when more than two states are in contention. The perceived solidity of stability may wax and wane: thus, it is a goal to be striven for and once achieved, it needs tending to. Strategic stability requires that national decision-makers see merit in the benefit while continuously observing and assessing what is needed to maintain it. Some level of trust and compromise between states is usually necessary to this end.

Nuclear weapons play an important part in strategic stability alongside politics, economics, security, demography, history and culture. Successful nuclear deterrence can induce strategic stability of a sort. Deterrent postures and doctrines that are reciprocally credible to each of the adversaries should have that effect. One reason to acquire nuclear weapons, after all, is to compensate for or rectify a perceived conventional military imbalance.

The historical evidence from states operating a nuclear deterrent suggests that the introduction of assured second-strike capability by two adversarial parties provides a good measure of stability. Both India and Pakistan claim to possess a second-strike capability and have made clear their determination to reinforce the survivability (or relative invulnerability) of that capability by seeking to place nuclear weapons on naval ships (see Chapter Four).

The very presence of nuclear weapons can, however, also erode strategic stability by encouraging limited conventional conflict. Academics and strategic planners call this the ‘stability–instability paradox’. Larger-scale war is too risky with nuclear weapons, so limited state-on-state conflict or crises can become likelier. Such crises can involve state-sponsored militias or militant proxies (a means of undermining eventual ‘sub-conventional deterrence stability’ existing between two countries’ non-regular and non-nuclear forces), which also raise sensitivity to alleged state-sponsored interference.

Outside their nuclear armouries, states may deliberately seek to manipulate risk. They may seek to increase the imbalances between them to better play to their national advantages and more likely prevail over the other in certain non-nuclear conflicts. There is evidence that both India and Pakistan have made this judgement (see Figure 2).

Such forms of warfare, which variably rely on combinations of coercion, ‘compellence’ and ‘implausible deniability’ delivered in part through traditional and social media, can be known as ‘hybrid’, ‘fifth-generation’, ‘grey-zone’, ‘tolerance’ or ‘threshold’ warfare. Nuclear-armed states may be able to derive real or perceived benefits from such strategies, including inducing US- and other third-party-led crisis management. But these advantages are set against the risks of inadvertently reaching the point at which a crisis becomes so intense that political and military leaders become driven by specific considerations of using nuclear weapons. Such strategies make strategic intent harder to convey unambiguously: does evidence allow for the attribution of the perceived aggression to the presumed perpetrator? Was action taken for punishment, tit for tat, or to induce a broader change of state behaviour?

Strategic stability may be harder to achieve and precarious to maintain where there is an underlying political problem between states that they have failed to resolve together, or that they have attempted to resolve by resorting to armed violence. In the South Asian context, the dispute over Kashmir is an example of such a problem. The dispute’s diplomacy is a long-standing feature of both countries’ foreign policies. Domestic political polarisation or consensus both partly result from and influence it. More generally, perceptions can undermine a sincere intent to build strategic stability. One country’s search for strategic stability might be seen by another as the imposition of strategic instability. Second-guessing the opponent and their resolve, and planning for worst-case outcomes – something that all militaries must do – can also encourage unhelpful speculation. Finally, the introduction of new technology and isolated events, within or outside the control of the state, are other complicating factors (see Chapter Four).
Such people [Pakistan-based terrorists] need to be taught a lesson. There is no question mark in it. But when, how and at what time, should be decided based on our convenience … As we say, no one tells the world what you do and what happens inside a bedroom.’

**INDIA:** Minister of Defence Manohar Parrikar, 5 February 2016

‘We don’t itch for a fight, but if someone looks at the country with evil eye, we will gouge his eyes out and put them back in his hand, we have that much power … There was no firing on the border for the last three days because if they [Pakistan] fire once, we fire twice at them. … Even if you are going to hunt a rabbit, be prepared to kill a tiger.’

**INDIA:** Minister of Defence Manohar Parrikar, 26 November 2016

‘The prime minister has summoned a meeting of the National Command Authority [NCA]. I hope you know what the NCA means.’

**PAKISTAN:** Army spokesman, 26 February 2019

‘This non-military preemptive action was specifically targeted at the JeM camp.’

**INDIA:** Ministry of External Affairs press release, 26 February 2019

‘India has stopped the policy of getting scared by Pakistan’s threats. Every day, they [Pakistan] would make claims about having nuclear weapons. Even the media would bring out reports about Pakistan having nuclear weapons. So what do we have? Are we saving them [nuclear weapons] for Diwali?’

**INDIA:** Prime Minister Narendra Modi, 21 April 2019

‘It’s no longer going to be hide and seek. If we have to go across, we will, through the air or the ground route or both. The red line has been very clearly drawn as to what will be the future course of action.’

**INDIA:** Army Chief Gen. Bipin Rawat, 30 September 2019

‘If Pakistan does not stop its policy of state-sponsored terrorism, we reserve the right to pre-emptively strike at the sources of terror threat and this intent has adequately been demonstrated in our response during surgical strikes and Balakot operation.’

**INDIA:** Army Chief Gen. M.M. Naravane, 31 December 2019

‘Pakistan’s policy in a limited conflict – I am not talking of outright war, in a limited conflict, or in limited attacks by India, look at the types that we saw last year – Pakistan’s stated policy is ‘Quid pro Quo Plus’, which amplifies very clearly that we will not take it lying down, and we will get right back, plus a bit.’

**PAKISTAN:** Lt-Gen. (Retd) Khalid Kidwai, NCA Advisor (and former Director-General, Strategic Plans Division), 6 February 2020, IISS meeting

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**Figure 2.** Select high-level public official statements indicating the fragility of peace between India and Pakistan and the intensity of rhetoric common during tensions

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### 1.4 Concluding observations

- Nuclear doctrine and deterrence in both India and Pakistan, as in all nuclear-weapons states, are subject to the considerations discussed in this chapter. The concepts of necessity and proportionality are cornerstones of the laws of war and civilised conduct. One implication is that changes to nuclear doctrine, while possible owing to changes of truly strategic circumstances, call for the most serious consideration. Nuclear doctrines are made to last. India’s and Pakistan’s doctrines must be judged with reference to the universal values of necessity and proportionality. Those yardsticks are just as relevant in South Asia as elsewhere.”

- Strategic stability, if it is to be achieved on the Indian subcontinent, will require the same
level of commitment to responsible statecraft as it does in other places. Specifically, below the nuclear threshold, South Asia’s nuclear-weapons states will need to resist any urge to sustain instability for what can often appear to be short-sighted purposes and in the self-deceiving hope that instability can be contained to the initiator’s advantage. Complacency, let alone complicity in allowing instability, could have terrible consequences.

Nuclear-armed states that resort to risk manipulation and use of force against each other below the nuclear threshold, in the expectation of strengthening strategic deterrence, benefit from entering and sustaining private dialogue on defence doctrines and postures. Risk reduction is not possible without a good understanding of how and to what purpose risk features in statecraft that could ultimately involve the use of nuclear weapons.
Notes


6 By implication the circumstantial requirements are set very high indeed for any use of nuclear weapons in a ‘limited’ fashion, for example to signal resolve or to end a crisis.

7 Such as hindsight bias (or assuming the next crisis will resemble the previous ones), groupthink, mirror-imaging or failures of imagination but also ‘confirmation bias’ (considering hypotheses that are already held as true) or the ‘anchoring effect’ (placing undue weight on the first piece of information encountered).


10 For one acknowledgement from India and call to shift from mutually assured destruction (MAD) to mutually unacceptable destruction (MUD), see Nitin Pai, ‘MUD, not MAD’, Acorn, 31 August 2009, http://acorn.nationalinterest.in/2009/08/31/mud-not-mad/.
2. India’s and Pakistan’s nuclear doctrines

India’s and Pakistan’s nuclear doctrines are reasonably well established but neither has been set out in a thorough, clear and comprehensive manner. Those seeking clarity must rely on press releases, draft documents or on-the-record talks by senior officials.

There has been much academic speculation and interpretation over the years, along with some political commentary and written reflections on the nuclear doctrines by retired senior officials. But the fundamentals of the two doctrines are clearly delineated, with their owners describing them as ‘credible’ and ‘minimum’. Notably, those two principles have, in recent years, become less coequal, with both states placing greater emphasis on credibility.

2.1 India’s and Pakistan’s nuclear doctrines

India has a policy of NFU of nuclear weapons against all nuclear-armed states, but with a commitment to retaliate in the case of any use of nuclear, or large-scale chemical or biological, weapons against its territory or its armed forces anywhere. In 1999, India explicitly eschewed the recourse to a nuclear first strike. Irrespective of target or nuclear yield, retaliation is characterised as massive and designed to cause unacceptable damage (and therefore war termination). There is no provision for graduated escalation. No one potential adversary is identified. India reviews its doctrine periodically but has not revised it since 2003 (there is woefully little public discourse about this at home or abroad).

![Figure 3. Select evidence from the body of public statements making up India’s nuclear doctrine](image-url)
Pakistan has a policy of ‘full-spectrum deterrence (FSD)’, designed to prevent conventional conflict at any level by the threat of nuclear first use in response to aggression. Pakistan’s first response may, and probably would, be conventional. It would resort to nuclear use in response to a ‘large-scale attack’. The full spectrum covers both short-range, low-yield weapons and long-range weapons to cover the most distant targets in India, which is identified as the sole adversary. While the capability to inflict unacceptable damage is inherent in the full-spectrum approach, the threat of the use of short-range weapons is meant to deny India the space for limited conventional war.

Neither doctrine includes a suggestion of pre-emption using nuclear weapons or a disarming first strike as policy.\(^3\) Nor is there explicit discussion of either counterforce or countervalue targeting.\(^4\) Both doctrines implicitly embrace the latter, without, in Pakistan’s case, categorically excluding the former. Both sides assert the existence of a second-strike capability and, in this context, both parties refer to the acquisition of sea-based capability to complete a triad of air-, land- and sea-based nuclear weapons. The doctrines include considerations of command and control, the need for resilience and the desire for peace.

Clearly, the two doctrines are not symmetrical, which is not surprising since the two states experience radically different strategic situations. Broadly speaking, India’s motivation for becoming a nuclear-armed state was to deter a nuclear-armed China’ (see also Chapter Three); it rejects the notion, popular with some Western analysts, that the prestige of possessing nuclear weapons played a role. Pakistan’s conventionally inferior military position vis-à-vis India, a much larger country, gave rise to the desire to compensate for that imbalance by acquiring a nuclear equaliser and deterrent.

Analysis of the interplay between these doctrines leads to concern that, in a crisis leading to armed conflict, grave risks would arise. After their 1998 nuclear-weapon tests, that concern was genuine during the India–Pakistan crisis of 1999 (in the Kargil district of Kashmir), as well as that of 2001–02 (a military mobilisation following a terrorist attack on India’s parliament). The conclusions of that analysis are set out below.

\[\text{[Nuclear weapons will be used only] if the very existence of Pakistan as a state is at stake. … Nuclear weapons are aimed solely at India. In case that deterrence fails, they will be used if: a) India attacks Pakistan and conquers a large part of its territory (space threshold); b) India destroys a large part either of its land or air forces (military threshold); c) India proceeds to the economic strangling of Pakistan (economic strangling); and d) India pushes Pakistan into political destabilization or creates a large scale internal subversion in Pakistan (domestic destabilization).}\]

PAKISTAN: Lt-Gen. (Retd) Khalid Kidwai, Director-General, Strategic Plans Division, 2001

‘Pakistan possesses a full spectrum of nuclear weapons … with full range coverage of the large Indian landmass and its outlying territories. There will be no place to hide.’

PAKISTAN: Lt-Gen. (Retd) Khalid Kidwai, NCA Advisor, December 2017, IISS meeting

‘Over the years Pakistan’s nuclear policy has transited to the concept of Full Spectrum Deterrence (FSD) while remaining within the larger philosophy of Credible Minimum Deterrence as a response to the evolving nature of threat.’

PAKISTAN: Lt-Gen. (Retd) Khalid Kidwai, NCA Advisor, 6 November 2018

‘Pakistan’s nuclear capability operationalised under the well-articulated policy of FSD comprises of a large variety of strategic, operational and tactical nuclear weapons, on land, air and sea, which are designed to comprehensively deter large-scale aggression against mainland Pakistan.’

PAKISTAN: Lt-Gen. (Retd) Khalid Kidwai, NCA Advisor, 6 February 2020, IISS meeting

2.2 Challenges: proportionality assumption

The first issue involves the assumption of proportionality. Proportionality is a criterion not obviously associated with weapons of mass destruction when the survival of the state is at stake and a defence of last resort is invoked. But it is relevant when conflict short of that existential exigency is involved. There has been much focus on the
possibility of an Indian land-force incursion into Pakistan after a terrorist attack on India that, it determined, was in some way state-sponsored. In this context, Pakistan does not commit itself to using its nuclear weapons as a last resort only. An Indian armed response of such weight and vigour as to come close to paralysing Pakistan would call into question the survival of the state; but a limited attack with small-scale objectives amounting to a punitive raid should not give licence for an unlimited response involving the first use of nuclear weapons.

The potential disproportion arises in the doctrinally possible use of ‘small’ nuclear weapons by Pakistan against a land-force incursion, short of an all-out invasion, to halt it or signal greater nuclear escalation if it continued. In a February 2020 presentation at the IISS, Lt-Gen. (Retd) Khalid Kidwai, the architect and first director-general of Pakistan’s Strategic Plans Division (SPD), the secretariat of the country’s National Command Authority (NCA), and since 2013 an appointed advisor to the NCA, for the first time abroad indicated Pakistan’s threshold for use might have risen to only ‘comprehensively deter large-scale aggression against mainland Pakistan’. Compared to his previous statements, this formulation amounts to a slight upping of Pakistan’s nuclear threshold for use (see Figure 4). Yet if the taboo were broken this would open a Pandora’s box in respect of retaliation. A contrary view could argue that proportionality should be measured in explosive power (measured in kilotons equivalent of TNT explosive) not explosive material (nuclear as opposed to conventional), and that the use of a small nuclear warhead to defend against a superior conventional military force showed restraint. The thick red line of the taboo would nonetheless have been breached, with unknowable consequences.

Disproportion also arises in the event of an Indian response to the limited first use of nuclear weapons as in the scenario described above, by massive retaliation as stated by the policy, to cause unacceptable damage to the opponent (see Figure 5).

Both sides argue the logic of their case strongly in terms of deterrent effect, but what is striking is that both also repudiate the credibility of the other’s potential use in such circumstances. This disbelief originates largely from the sense of disproportionality in the eyes of those who are meant to be deterred. There is therefore a grave risk of deterrence failure if the two parties consider the other side’s doctrine to lack credibility (see Figure 6). ‘Incredible’ doctrine is dangerous and destabilising.

2.3 Challenges: automaticity and escalation-management assumptions

Compounding the worry about disbelief is the deterrent narrative on both sides, which creates the impression of automaticity: ‘If X occurs and my doctrine says that in this circumstance nuclear weapons should be used, they must and will be.’ This syllogism is a risk common to all nuclear-armed states. Tripwire responses are built on the back of red lines and standardised procedures. Predictability can make a healthy contribution to deterrence but only provided a good level of shared understanding exists between the putative opponents. Such clarity of strategic expectations can be developed by relying on identifiable threats to national survival (this is less likely in respect of hostile acts that fall short of materially affecting vital national interests).

A prominent inconsistency between India’s and Pakistan’s doctrines is manifest in the implied
expectations of escalation and its management. For India, the doctrine speaks of a one-time, ‘one-rung’-only escalation to massive retaliation, to which no further response is anticipated. For Pakistan, the FSD posture is geared towards preventing conventional aggression at any level by threatening, at a minimum, nuclear use of limited yield both as a signal and for tactical effect. The implied expectation is that the aggression would then cease or that graduated nuclear escalation would commence.

Releasing nuclear weapons on a conventional battlefield would at a stroke change the nature of the conflict and would take the parties into unknown territory in terms of escalation; there are no grounds for confidence that a ladder of escalation would be judiciously and reciprocally mounted, step by step. But such an approach is completely at odds with India’s stated doctrine. The notion that nuclear escalation can be managed is a fallacy implying a risk of vast proportions. India’s awareness of this is old and reflected in its NFU pledge, which is partly inspired by the need to guard against this very risk. Pakistan has in recent years come to recognise this, both above and below the threshold of nuclear use. This awareness could be self-serving, however, by also playing to Pakistan’s broader argument that India ought to be deterred from any temptation to approach the nuclear threshold in the first place.

‘Nuclear weapons are weapons of deterrence. They are not weapons for war fighting. I find it difficult to comprehend when someone proclaims he will use them for conventional war fighting or if he is attacked. Will the world community ever allow you to use nuclear weapons like this? Pakistan’s statements show an inappropriate understanding of the employment of strategic weapons.’

INDIA: Army Chief Gen. Bipin Rawat, 30 September 2019

‘If India’s doctrine is in-credible, what do I make of it? … I am as perplexed perhaps as anyone else would be, that you project some documents as doctrine, then you start saying these are not doctrine, then you start saying there is first use, then it is NFU [no first use], then there is a conditional NFU. So what is it exactly that the Indians want to do?’

PAKISTAN: Brigadier Zahir Kazmi, SPD, 29 March 2017, IISS meeting

‘A limited nuclear war is a contradiction in terms. Any nuclear exchange, once initiated, would swiftly and inexorably escalate to the strategic level. Pakistan would be prudent not to assume otherwise as it sometimes appears to do, most recently by developing and perhaps deploying theatre nuclear weapons.’

INDIA: Ambassador (Retd) Shyam Saran, Chairman, NSAB, 24 April 2013

‘Tactical or strategic, [Nasr] is a nuclear weapon. Our response would be absolutely violent, if it is used, as per our existing policy.’

INDIA: Air Chief Marshal P.V. Naik, Chairman of the Chiefs of Staff Committee (CoSC), 27 July 2011

Below the threshold of nuclear use, as of 2020, Pakistan has shifted away from a stance where it saw no space for conventional warfare. It now sees a little, undefined room for escalation (see Chapter One). This comes with a declared policy of ‘Quid pro Quo Plus’, stating that it will counter conventional use of force by India ‘with a bit of a plus’, suggesting more bravado
and greater cost imposition than tit for tat, stability and de-escalation. After the 2019 crisis, India also sees space for the use of military force under its perception of Pakistan’s nuclear threshold on land, as well as at sea. Seeing such space opens inadvertent pathways to the nuclear threshold through conventional means, however light or pinpoint (‘surgical’). From one crisis to the next they also risk ratcheting up the intensity of the use of military force.

### 2.4 Concluding observations

- The doctrinal disparity between India and Pakistan gives rise to risk and the real possibility of miscalculation. Mutual perception of the doctrines appears to centre around incredibility. That is not to say that the doctrines need to be precisely aligned. But if Pakistan threatens a limited or low-level nuclear use (not first strike) against an incursion it equates with a ‘comprehensive large-scale aggression against its mainland’ and India threatens massive retaliation for any use at all, the result could be catastrophic.

- Misunderstandings, misperceptions and misjudgements could well occur in a crisis, however well the authorities on both sides claim to know the psyche of the other. The idea that ‘those who need to know do know’ is unconvincing in practice and may undermine politicians’ responsibilities for oversight and accountability. Mutual disbelief is also affected by a degree of mirror-imaging, which is not exclusive to South Asia: one side presumes too easily that it can second-guess the other’s coming actions because the latter is presumed to share similar interests and face comparable dilemmas.

- The reasonable yardsticks of necessity and proportionality that underpin deterrence and nuclear strategic stability (see Chapter One) suggest that the use of nuclear weapons should only be considered in extreme circumstances when national survival is at stake. Pakistan does not, however, commit to using nuclear weapons only as a last resort or in extremis if the survival of its state were in danger. The juxtaposition of India’s and Pakistan’s doctrines risks the possibility of a nuclear exchange in a situation far short of that ultimate contingency. Since the 2019 crisis, both countries see space for use of military force under their respective perceptions of the other’s nuclear threshold.
Notes


2 For a recent influential position in this debate, see the views of a former head of strategic forces, B.S. Nagal, ‘Reassessing India’s Doctrine’, National Security, vol. 3, no. 2, April–June 2020, pp. 169–84, https://www.vifindia.org/sites/default/files/national-security-vol-3-issue-2-colloquium-BNagal.pdf. There has been particular controversy about India’s commitment to its own NFU pledge, following statements originating in India. But evidence points to continued adherence by India to this pledge. On 16 March 2017, former Indian special envoy of the prime minister of India for disarmament and non-proliferation issues, Ambassador (Retd) Rakesh Sood, offered a nuanced and comprehensive rebuttal of those doubts: ‘When people talk about changing NFU and moving to first use, it is not just a question of deleting one word, it comes with a whole range of paraphernalia associated with it. What is the kind of arsenal that you would have, if you were to engage in First use? What is the kind of command and control that you would have, and what would be the delegation levels if you would engage in First use? Looking at First use then what are the kind of threats that you would need to deter by positing First use? It takes you away from sole purpose and a whole host of other things. Which is why we have not gone down that particular road, because going down that road would make it inconsistent with the historical experience that I pointed out.’ See ‘India’s nuclear doctrine and nuclear diplomacy’, address by Ambassador Rakesh Sood at the IISS, London, 10 April 2017, https://www.youtube.com/watch?v=5jN2_zW_MVk. For one view and analysis of the relationship between NFU and perceptions, see Bruno Tertrais, ‘No First Use, No Deterrence’, Strafasia, 7 October 2019, https://strafasia.com/no-first-use-no-deterrence/. Sceptics of India’s NFU pledge have taken particular note of the statement by India’s defence minister in August 2019: Rajnath Singh (@rajnathsingh), ‘Pokhran is the area which witnessed Atal-ji’s firm resolve to make India a nuclear power and yet remain firmly committed to the doctrine of “No First Use”. India has strictly adhered to this doctrine. What happens in future depends on the circumstances’, 16 August 2019, https://twitter.com/rajnathsingh/status/1162276901053893504. Tweet.


8 IISS discussions with Pakistani military officials since 2017.

9 Keynote Address and Discussion Session with Lt-Gen. (Retd) Khalid Kidwai’.
This chapter explores how India and Pakistan have matched their military means across the spectrum of conflict to their statements of intent as defined in their doctrines. Indian and Pakistani military capabilities are formidable in both the conventional and nuclear arenas. The chapter considers current (real or perceived) and future conventional and nuclear capabilities in order to reach a comprehensive view of deterrence and risk between the subcontinental rivals.

Several broad points are worth noting before assessing India’s and Pakistan’s capabilities. Firstly, the potential for confrontation between the two countries covers the entire spectrum of warfare from acts of terrorism (i.e., ‘asymmetric’ or ‘sub-conventional’) with varying degrees of attribution, to conventional combat in its many forms, to nuclear exchanges (see also Chapter One). Militant groups based in Pakistan have been engaged in asymmetric warfare against India for at least three decades and Pakistani officials claim that India sponsors subversion and violence inside Pakistan, while the two countries’ armies have exchanged artillery and small-arms fire across the Line of Control (LoC) in Kashmir with increasing frequency in recent years.

Secondly, both sides’ capabilities are constantly evolving. It is not clear, however, if new equipment is acquired, or new tactics promulgated, as part of integrated strategies either within a single service (e.g., within the army) or across services (e.g., orchestrated between the army and the air force).¹ Some enhancements in hardware also represent simple product improvements rather than substantive shifts in capabilities. Some acquisitions seem driven by technological opportunities or bureaucratic impulses rather than by national strategy or stated military requirements (e.g., premature announcements on missile-defence capabilities by Indian defence scientists or exploration of missiles with presumed ranges far beyond those needed to target China).²

Thirdly, although this primer is focused on the India–Pakistan dyad, China is a major factor in India’s security calculations, both conventional and nuclear. India’s 1962 defeat in a brief border war against China has not been forgotten, and serious incidents³ along the 3,500-kilometre Line of Actual Control (LAC) in 2013, 2014, 2015, 2017 and 2020, as well as China’s military-modernisation programmes, reinforce New Delhi’s concerns about its northern neighbour. Similarly, China’s first nuclear test in 1964 was a major driver of India’s nuclear-weapons programme, and Chinese advances in nuclear and missile technology continue to prompt Indian responses. Furthermore, many in India have perceived a growing collusion between China and Pakistan over the past decade, heightening apprehension about potential Sino-Pakistani cooperation in any conflict scenario. Many Indians thus see a ‘two-front war’ in which they would have to conduct active combat operations against Pakistan and China simultaneously as increasingly likely.⁴ As a result, Indian analysts increasingly discuss regional nuclear weapons in the context of

#### Table 1. Evidence of the national power gap between India and Pakistan

<table>
<thead>
<tr>
<th></th>
<th>India</th>
<th>Pakistan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population (July 2021 est.)</td>
<td>1.339bn</td>
<td>238.2m</td>
</tr>
<tr>
<td>GDP, 2020 (current US$)</td>
<td>US$2.59trn</td>
<td>US$303.4bn</td>
</tr>
<tr>
<td>GDP per capita, 2020</td>
<td>US$1,877</td>
<td>US$1,482</td>
</tr>
<tr>
<td>Defence budget, 2020 (constant 2015 US$)</td>
<td>US$95.8bn</td>
<td>US$113.3bn</td>
</tr>
<tr>
<td>Defence budget, 2020 (current US$)</td>
<td>US$64.1bn</td>
<td>US$10.8bn</td>
</tr>
</tbody>
</table>

‘Southern Asia’ (i.e., the India–Pakistan–China triangle – see Figure 7). Despite these perceptions, Beijing has not offered any formal security guarantees to Islamabad on nuclear-weapons matters and the prospect of China issuing nuclear threats to India on Pakistan’s behalf seems exceedingly remote. The stability of nuclear deterrence between India and Pakistan thus remains the exclusive preserve of Indian and Pakistani decision-makers.

### 3.1 Comparing conventional forces

Conventional forces set the context for consideration of nuclear weaponry, but before examining each country, it is useful to define which aspects are truly significant in a comparison. For the purposes of this primer, those aspects are procedures, weapons, tactics or organisations that on their own or in combination could have a consequential, perhaps determining, effect on the outcome of an India–Pakistan war or major armed confrontation. Regarding equipment, this means the relevant hardware (such as a particular tank type or artillery piece) must be present in sufficient numbers to have a substantial impact beyond the tactical level (i.e., beyond the immediate area of their employment).

In the Second World War, for example, the Allies eventually deployed enough long-range fighters and developed apt tactics to provide armed escort to bomber fleets (also in large numbers) that had a significant impact on German manufacturing, fuel depots and transportation networks. In contrast, small numbers of modern pieces of equipment, such as 20–30 advanced attack helicopters, would be useful locally, but would not alter the results of a conflict involving two nations as large as India and Pakistan. Similarly, equipment must be embedded in a modern organisational and doctrinal framework. To use another Second World War example, the hardware inventory of the German Army during the invasion of

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**Figure 7. The India–Pakistan–China border trijunction**

Note: map accurate as of March 2021

©IISS

Source: IISS
France in 1940 was in most cases no better than and often inferior to that in the Allied arsenal, but superior training, leadership, organisation and tactics in execution enabled a stunning victory. Simply upgrading individual items of equipment, on the other hand, would be unlikely to produce a decisive change beyond the tactical battlefield.

Seen through this analytical lens, neither India nor Pakistan has a decisive qualitative conventional military edge. Both maintain large, professional, army-dominated military establishments with considerable experience in counter-insurgency (COIN) operations. There are certain to be variations on a unit-by-unit basis, but they largely share the same strengths and weaknesses across all three services. Neither country has a significant advantage in training, education, leadership or morale, and both can implement their tactical doctrines. Joint (i.e., multi-service) operations have traditionally been problematic for both countries, but Pakistan may have improved army-air-force cooperation through its actions against militants on its western frontier since at least 2004. This advantage could erode over time as experienced officers move to new assignments and previous collaboration fades. Similarly, although both armies have been heavily involved in COIN operations of various types for many years, it is not clear that this experience is directly transferable to large-scale conventional combat against a peer competitor.

Quantitatively, on the other hand, India’s armed forces outnumber Pakistan’s in almost every respect. The Indian Army is over twice the size of its Pakistani counterpart in total manpower and fields 37 manoeuvre divisions compared to Pakistan’s 22. The equipment differential is not as stark but would still seem to give India a distinct advantage (see Table 2). Likewise, the Indian Air Force (IAF) has

<table>
<thead>
<tr>
<th>2020</th>
<th>India</th>
<th>Pakistan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active military</td>
<td>1,458,500</td>
<td>651,800</td>
</tr>
<tr>
<td>Active paramilitary</td>
<td>1,585,950</td>
<td>291,000</td>
</tr>
<tr>
<td>Army manoeuvre divisions</td>
<td>37</td>
<td>22</td>
</tr>
<tr>
<td>Principal surface combatants</td>
<td>28</td>
<td>8</td>
</tr>
<tr>
<td>Submarines</td>
<td>16</td>
<td>8</td>
</tr>
<tr>
<td>Surface-to-surface missile launchers</td>
<td>69</td>
<td>165</td>
</tr>
<tr>
<td>Artillery</td>
<td>11,003</td>
<td>4,595</td>
</tr>
<tr>
<td>Armoured fighting vehicles</td>
<td>7,088</td>
<td>6,067</td>
</tr>
<tr>
<td>Fixed wing</td>
<td>1,391</td>
<td>732</td>
</tr>
</tbody>
</table>


Figure 8. IISS Military Balance summary assessment of India’s and Pakistan’s overall military capabilities (excerpts)

INDIA
‘India continues to modernise its armed forces, though progress in some areas remains slow. The armed forces are oriented against both Pakistan and China, and violence on the Western frontier with China in 2020 raised tensions. There is growing focus on Indian Ocean security. … India continues to develop its nuclear capabilities. In 2020 the first Chief of Defence Staff was appointed, which may improve high-level coordination of military planning. … Recent imports of foreign equipment have primarily been from the US and France, although India is also interested in Russian equipment such as air-defence systems. … However, the overall capability of India’s large conventional forces is limited by inadequate logistics, maintenance and shortages of ammunition, spare parts and maintenance personnel. Though modernisation continues, many equipment projects have seen delays and cost overruns, particularly indigenous systems.’

PAKISTAN
‘Pakistan’s nuclear and conventional forces have traditionally been oriented and structured against a prospective threat from India. … Recruitment is good, retention is high and the forces are well trained … Funds have been directed towards improving security on the border with Afghanistan. Major investment in military nuclear programmes continues, including the testing of a nuclear-capable sea-launched cruise missile. The navy plans to increase surface combatants, patrol vessels, submarines (in collaboration with China), maritime-patrol aircraft and UAVs [uninhabited aerial vehicles]. This is to both improve combat capability and the protection of sea-based nuclear weapons. The air force is modernising its inventory while improving its precision-strike and ISR [intelligence, surveillance and reconnaissance] capabilities.’

nearly twice as many combat aircraft as the Pakistan Air Force (PAF). The difference at sea is especially notable as the Indian Navy has more than twice as many submarines and major surface combatants as Pakistan; it also has the region’s only aircraft carrier, with at least one more to be delivered by 2022. Though by no means the only factor driving Pakistan’s nuclear-weapons programme, India’s numerical superiorities are clearly one of the most significant and certainly one of the factors cited most frequently by Pakistani officials and analysts. India’s acquisition of conventional naval platforms to counter China in the Indian Ocean is also creating anxieties for Pakistan.

India’s numerical advantages, however, are deceptive; simply counting tanks, fighters and frigates can lead to erroneous conclusions. Firstly, India cannot leave its northern border unguarded. This requirement could occupy up to one-third of the army and a substantial portion of the air force even if Pakistan and China are not actively colluding. Secondly, much of India’s hardware inventory is obsolete or obsolescent, meaning that the numbers do not necessarily equate to capacity. The IAF, for example, is sometimes described as being ‘in crisis’ because of equipment deficiencies and numerous other problems, according to a veteran analyst, while the army faces serious shortfalls in everything from artillery to ammunition. Thirdly, a poor record of inter-service cooperation and serious deficiencies in logistics and mobility undermine India’s ability to employ its superior numbers. Finally, Pakistan enjoys a geographic advantage as most of its ground-combat formations are close to the border, while much of India’s offensive armoured power is garrisoned hundreds of kilometres away to the east.

India has no incentive to attack Pakistan without provocation, that is, no incentive for a sudden surprise strike or ‘bolt from the blue’ as it was popularly called during the Cold War. Pakistani officials at the highest levels, however, increasingly raise the possibility of an attack resulting from a supposed ‘false flag’ operation. They claim that India would instigate or orchestrate a terrorist attack on its own soil, against its own people, to create an excuse to attack Pakistan. Nonetheless, the most probable scenario would be Indian military action against Pakistan as punishment for an attributed terrorist incident. Achieving strategic surprise in such a scenario would be virtually impossible: by the time Indian ground forces closed in on the border, Pakistani troops would have manned their defences. An Indian ground attack under such circumstances would be unlikely to achieve the desired rapid, low-cost success. In other words, India’s numerical superiorities would be unlikely to manifest themselves in any decisive manner in the sort of short conflict both sides envisage. Pakistan’s conventional forces would thus likely suffice to contain an Indian ground assault without resorting to nuclear weapons.

The Indian Army has attempted to mitigate its geographic problem by proposing a limited-war strategy of sudden, shallow thrusts by forces in place. This approach is popularly known as the Cold Start doctrine or ‘proactive operations’. Pakistan frequently cites Cold Start as a sign of aggressive Indian intent and as the rationale for its short-range, low-yield nuclear weapons, specifically the Hatf-9 Nasr multiple-launch missile system. Additionally, the Pakistan Army claims it has developed a defensive counter-strategy (called the ‘new concept of war fighting’) and is pursuing hardware acquisitions to bolster its conventional forces specifically in response to Cold Start. Lack of political approval by New Delhi and the Indian military limitations mentioned above, however, mean that India will be incapable of implementing such a doctrine, even if officially sanctioned, any time in the foreseeable future.

The adversaries’ navies are not likely to be critical factors in a scenario short of war. Moreover, the Indian Navy, its personnel and equipment, especially its carrier, notwithstanding, is beset by serious structural limitations that restrict its utility to a supporting role unless the conflict were extended. The exception to this could be the introduction of submarines as nuclear-delivery platforms (see Chapter Four).

‘The Cold Start doctrine exists for conventional military operations. Whether we have to conduct conventional operations for such strikes is a decision well-thought through, involving the government and the Cabinet Committee on Security.’

India’s military-modernisation initiatives are not likely to alter this capability assessment for the policy-relevant future. Although Pakistanis argue that India is engaged in supposedly ‘massive’ military-modernisation efforts, this impression is misleading. India’s defence budget has risen only marginally in recent years, but most of the increase is consumed by manpower costs (including pensions), and defence spending has declined to approximately 2% of GDP. In any case, defence expenditure cannot be the sole metric of military capability. Similarly, reports that India has been the world’s second-largest arms importer in recent years are misleading. Most of India’s various modernisation programmes as currently structured and executed will have at best local, marginal impact on the course of a future war unless they can be concentrated at the decisive place and time. The acquisition of 22 AH-64E Apache attack helicopters or 14 P-8I Neptune anti-submarine-warfare aircraft from the US are but two of many examples of what may be termed ‘niche modernisation’; that is, the procurement of small numbers of high-profile systems, the strategic significance of which in conventional conflict could be overplayed.

Growing capabilities for the delivery of precision-guided and stand-off munitions, on the other hand, even if insufficient for a major conventional war, may create more escalatory options for both sides at the lower end of the conflict scale. That is, national policymakers and military commanders may be tempted to employ such munitions because they seem neat and limited, apparently ideal tools for a so-called ‘surgical strike’ with minimal consequences, perhaps without even crossing international borders. The manifold risks inherent in such thinking were evident in the 2019 Pulwama–Balakot crisis. Intelligence is never perfect; human, mechanical or software error can cause unintended damage; and the governments on both sides feel compelled to retaliate in a context where there are no obvious ways to prevent endless escalation. Nonetheless, the acquisition of such precision-guided and stand-off capabilities may widen the options for either side, creating additional dangers in a future crisis.

Additionally, there is a risk that Indian efforts to address its concerns about China, or its acquisitions intended to reinforce its role as a major player on the international stage, could stoke Pakistani anxieties even if such developments are not aimed at Pakistan per se. Analysts in both countries now readily admit the correlations between the India–Pakistan and India–China dyads in broad strategic terms. In other words, India could face an acute nuclear dilemma: what could be considered ‘minimum’ in terms of nuclear forces to deter Pakistan is insufficient to ensure ‘credible’ deterrence against China. But officials in both India and Pakistan reject as meaningless the notion that India could seek to designate more explicitly and exclusively some of its capabilities for China or Pakistan.

3.2 Nuclear forces: overview

India and Pakistan naturally surround their nuclear-weapons programmes with pervasive secrecy and intentional ambiguity. Much of what is known of their capabilities relies on estimates and reasonable supposition. Warhead numbers are particularly problematic. Recent estimates give Pakistan a slight edge with 160 warheads compared to 150 for India, but such a difference is hardly significant in any strategic sense. These estimates are speculative and could be off the true mark by a considerable margin. Beyond numbers, geographical dispersion and possessing missiles of the right range to be fired from an in-country point of origin to and over the border are more important. India may have an advantage on these counts given the size of its territory. But based on numbers of warheads only, the key is that the arsenal sizes are broadly equal as far as can be determined. Each country is thought to have fissile-material stocks sufficient to produce more, perhaps twice as many, but neither is assessed to have done so at present. Both countries’ weapons holdings are forecast to continue growing.

In the past, both countries were believed to store their weapons in ‘de-mated’ status, that is, with the warheads physically separated from their delivery systems and not fully assembled. This method of storage greatly reduced the chances of unauthorised launch or theft of a useable nuclear explosive device. This barrier is being eroded, however, by developments in both countries: perceived imperatives for greater readiness (reducing the time required to assemble and mate warheads to delivery means – see also Chapter Four); trends towards putting missiles in ready-to-fire canisters; and Pakistan’s introduction into service of the Hatf-9 Nasr ‘battlefield’ missile system, which would be deployed close to the front. Both countries rely on a mix of gravity bombs and ballistic missiles as delivery
means. Pakistan can also depend on cruise missiles. Some regional analysts assert that a small number of the other side’s newest foreign-origin fighter aircraft may have a nuclear role soon, if not currently. Such types include the China-designed JF-17 Thunder aircraft of the PAF and the IAF’s new French-made Rafale. Yet these claims are premature in the absence of official confirmation.

Neither side is believed to have pursued some of the weaponry deployed by the US and the Soviet Union during the Cold War, such as nuclear artillery shells, landmines (also called ‘atomic demolition munitions’), torpedoes or depth charges. Yet given their existing and projected arsenals, both are capable of inflicting unacceptable damage on each other as adversaries. Both claim to currently have a second-strike capability, however fledgling, but neither at present can launch a counterforce first strike with any assurance of success in preventing a second strike or ending a conflict.

India and Pakistan place a high priority on ensuring the physical and other protection of their nuclear weapons or their components against the threat of unauthorised use by renegades or non-state actors. This matters to deterrence stability given the absence of a framework between the countries to discuss the consequences of an incident or non-state attack that could result in a large release of radiation likely to cross boundaries. Pakistan and India’s commitments to securing their civil nuclear industries are both well documented. Yet like other nuclear-weapons countries, details of security arrangements surrounding their military capabilities are scarce. Commercial-satellite imagery records ongoing improvements to perimeter security around military and associated fuel-cycle activities in both countries. Yet almost all that is known about nuclear security comes from the very government agencies charged with providing that security. There is therefore little to no independent confirmation and little independent oversight within either state

Figure 10. India’s notional missile ranges (excludes submarine-launched)

Select tested missiles only. Ranges depicted are based on launch to maximum distance.

Sources: See Annex 3, p. 67
apparatus. In Pakistan, terrorists assisted by rogue navy personnel carried out attacks in 2011 on the Mehran navy base near Karachi, and in 2014 on the PNS Zulfiqar missile frigate in Karachi harbour. These incidents appeared to give credence to long-held fears about the military’s inability to guarantee the physical security of the country’s nuclear arsenal. But since 2015, instances of terrorist violence directed against the Pakistani state have consistently diminished. Pakistani officials have assessed that, as a result, Pakistan’s record on managing nuclear security and safety is ‘as good, if not better than that of the US’.

Following the period when doubts abounded, the view that Pakistan has appropriate measures in place regarding its military programme is now more widely shared. India’s arsenal is not known to have been the target of violent or spectacular attacks by terrorists.

Figure 11. Pakistan’s notional missile ranges (excludes underwater-launched)

Select tested missiles only. Ranges depicted are based on launch to maximum range from inside each country’s land mass. Currently, for air-launched weapons, especially Pakistan’s stand-off missiles, which could be fired from above the sea, radius also depends on the range of the aircraft firing the weapon and the availability of air-to-air refuelling.

Sources: See Annex 3, p. XX

Select missiles only. Ranges depicted are based on launch to maximum distance. For air-launched weapons, radius depends on type of aircraft used and availability of air-to-air refuelling.

Sources: See Annex 3, p. 67
3.3 Nuclear forces: Pakistan

Although Pakistan is assumed to reserve a certain portion of its arsenal for gravity bombs delivered by fighter aircraft, it relies primarily on a broad array of ground-based ballistic missiles, now being supplemented by air-launched and ground-launched cruise missiles (see Annex 1). Pakistan does not say how it would match those weapons to the ‘strategic, operational and tactical’ contexts its doctrine describes. In addition to counterforce attacks on military targets, these missile assets give Pakistan the ability to hit any Indian city should it follow a countervalue strategy implicit in its doctrine (see Chapter Two). India has more than 40 urban centres with populations above one million, and the potential devastation of Gwalior or Bengaluru must be assumed to convey the same degree of deterrent threat as an attack on New Delhi or Mumbai. Despite perfunctory public objections to Indian interest in missile defence (see Chapter Four), therefore, Pakistan has a profusion of major targets, both military and civilian, that it could strike to inflict unacceptable damage, for the requirements of credible nuclear deterrence.

Given the plenitude of vulnerable civilian and military targets in India, two of Pakistan’s nuclear-delivery decisions are controversial because of the dangers posed by their respectively very short and very long ranges. First is the Nasr missile system. Consisting of four missile canisters mounted on a wheeled transporter erector launcher, the Nasr can deliver a conventional or nuclear warhead to a range of 60–70 km. Nasr is assumed to be in service with the military, as official statements about training launches and exercises have claimed since July 2017. The short range has led many analysts to refer to the Nasr as a ‘tactical’ or ‘battlefield’ nuclear weapon, but Pakistanis insist on ‘short-range, low-yield’ as a descriptor. Russia and the US are the only other nuclear-armed states attributing this purpose to any of their weapons. Nasr has been advertised as an antidote to the Indian Army’s Cold Start doctrine and is thus proclaimed as a means of reinforcing deterrence. It is not clear, however, why other air- or ground-launched systems (such as existing short-range Hatf missiles or cruise missiles) could not have performed this function from greater depth inside Pakistan.

The Network has raised several concerns among regional analysts as well as outsiders. Above all, considering the nuclear taboo (see Chapter One), the use of any nuclear device, including the Nasr, would be strategic. That is, despite their short range and low yield, nuclear-armed...
Nasr missiles would not be tactical in impact or simply limited to ‘battlefield effects’. Within this overarching consideration, the first concern relates to the possibility that Pakistan could use nuclear weapons well before national survival is at stake, perhaps for putative signalling purposes. (Other nuclear-armed countries may also potentially deploy low-yield nuclear weapons, qualified, for example in the UK case, as ‘significantly reduced yield’ but placed on its submarines, not on land.)

Secondly, because it would have to transit to and deploy in the field close to the battlefront, the Nasr poses particularly worrying command-and-control problems. Pakistan’s leadership could face what is termed the ‘use it or lose it’ dilemma: in the confusion of war, the country’s NCA might fear losing precious nuclear assets to mishap or enemy action before they could be used for their stated purpose. An additional concern relates to delegation of launch authority. Would launch be delegated to local commanders, and if so at what stage of a conflict? Statements by Pakistani officials strenuously say that this would not happen under any circumstances. Could Pakistan’s NCA assure against unauthorised use? Statements by Pakistani officials imply that it believes it could. Many observers have also highlighted the danger of theft or misappropriation if these systems were deployed in a crisis. The third issue is increased arsenal size. If the Nasr is intended for decisive battlefield effect, that is, beyond supposed signalling, Pakistan would need dozens or hundreds more warheads to counter Indian armoured thrusts.

The final concern about the Nasr is that, as a dual-capable (conventional and nuclear) system, it is an example of what one scholar calls the ‘discrimination problem’ on the tactical battlefield. That is, how would Pakistan react if Indian forces, intentionally or not, attacked a Nasr battery? This would create an obvious risk, as Indian forces could not know if the Nasr was carrying conventional or nuclear warheads, but Pakistani decision-makers might perceive such a strike as an attack on the country’s strategic assets and decide to respond accordingly.

Pakistan’s second controversial nuclear-delivery decision is the 2,750-km-range Shaheen-3 (Hatf-6) ballistic missile. This has been explained as necessary because India might base active nuclear missiles at a proposed missile test site in the Andaman and Nicobar Islands or because of Pakistani suspicions about an India–Seychelles agreement to jointly develop a very small naval facility on Assumption Island (although Seychelles is out of the Shaheen-3 range). Nothing has been constructed at either site thus far and, given the vulnerability of numerous military facilities and urban centres across mainland India, neither of these alleged island targets seems consistent with an ability to inflict unacceptable damage for deterrence purposes.

Furthermore, such missiles cause concern as, if turned in the opposite direction, they have the range to strike Israel and other targets in the Middle East (including as far as Djibouti, which hosts Chinese, French, Japanese and US bases) and the northern Indian Ocean region.

### 3.4 Nuclear forces: India

Gravity bombs delivered by aircraft remain a more prominent part of India’s nuclear arsenal than...
Pakistan’s. But India also has a growing portfolio of missiles for nuclear delivery. Although its array of missiles is less diverse than that of its western neighbour, it fields a mixture of medium-range systems that could be employed against Pakistan, and longer-range variants that would be aimed at Chinese targets, as well as several potentially dual-purpose cruise missiles (see Annex 2). India’s nuclear military capabilities reflect its doctrine by concentrating on the country’s ability to absorb a first strike and still be able to retaliate massively (survivability). As far as is known, India has not yet developed a nuclear warhead for a cruise missile, but it could invest in one for the various versions of the Indo-Russian BrahMos (‘Brahmaputra-Moscow’), with a range of over 400 km, or for the indigenous Nirbhay, with a range of 1,000 km, which is currently undergoing testing. Unlike Pakistan, India is not assessed to have a short-range, low-yield battlefield nuclear-delivery system. Such weapons would be inconsistent with India’s doctrine, including for demonstration-of-resolve purposes. India has eschewed the ‘tactical nuclear-weapon’ path. But potentially dual-capability systems blur the line between conventional and nuclear conflict and thus create scope for misperception and risk.

3.5 Concluding observations

- India’s numerical advantage in conventional forces is not enough to guarantee a decisive victory in the sort of short war both sides expect. Moreover, India has neither reason nor interest to attack Pakistan in the absence of a severe provocation. Such a provocation would most likely come from terrorism or militancy at scale, thus creating a direct connection, potentially even a shortcut, between asymmetric warfare and the potential for nuclear release. Despite the then army chief’s comments about his service’s Cold Start doctrine, doubts persist about its political sanction by India’s leadership and implementation by the military as a whole or the army alone.

- The capabilities each side already possesses are enough to inflict the unacceptable damage postulated as necessary for deterrence (see Chapter One). Both sides could choose to remain focused continuously on what minimum, or failing that, what sufficiency, means in their doctrines, which both claim all three words – credible, minimum and deterrence. From the outcome of this decision, they could choose to also consider what capability they may have in excess of the requirement to deter their potential adversary in a nuclear crisis.

- Several serious risks lurk in extant capabilities, such as the discrimination and command-and-control problems associated with Pakistan’s short-range, low-yield Nasr system, as well as Pakistan’s desire to be able to target every inch of India. The discrimination problem concerns both countries’ dual-capable ballistic and Pakistan’s cruise missiles: one could carry a conventional warhead, but the adversary could not discount the possibility that it was carrying a nuclear one. Confusion can precipitate decisions based on worst-case assumptions.

- In some cases, technological opportunities and bureaucratic compulsions seem to override considerations of strategy in nuclear-weapon-related acquisitions, announcements and deployments. Proclaiming aspirational goals or exaggerating capabilities, for instance, creates concern on the other side, undermining minimalism and spurring arms-race instability.

- India’s legitimate requirements vis-à-vis China and its determination to play a major global role complicate the bilateral nuclear dynamic by creating strategic anxieties for Pakistan. That is, Indian actions designed to deter China (such as development of the Agni-V missile – see Chapter Four) can be seen, from Islamabad’s perspective, as increasing the threat to Pakistan. Governments in New Delhi and Islamabad can choose to research the facts of this situation as China becomes an ever-greater driver of India’s national security.
The threat of misperception and miscalculation based on consideration of capabilities alone (but in addition to those set out in the previous chapter) remains dangerously high, raising the horrific possibility of nuclear-weapons use across three basic scenarios: to send a supposed signal, to achieve a battlefield effect or to strike strategic targets. The acquisition of new capabilities, or even the retention of old, outmoded capabilities, could compound unpredictable circumstances in which India’s and Pakistan’s nuclear weapons would undermine rather than strengthen deterrence.
Notes

1 India is expected to inaugurate joint theatre commands in 2021, which could help it reach this goal. See Rahul Singh, ‘First joint commands to be launched by May’, Hindustan Times, 17 February 2021, https://www.hindustantimes.com/india-news/first-joint-commands-to-be-launched-by-may-10161350093277.html.

2 These issues are explored in detail in Yogesh Joshi and Frank O’Donnell, India and Nuclear Asia (Washington DC: Georgetown University Press, 2019). In Pakistan’s case, there is virtually no civilian political oversight of the military and scientific nuclear establishment.


24. Influential Indian experts periodically warn that unlike a state, jihadists intent on provoking the use of nuclear weapons between India and Pakistan may not be deterred by the threat of unacceptable damage.


27. ‘Keynote Address and Discussion Session with Lt-Gen. (Retd) Khalid Kidwai’.


33. Nuclear entanglement’ is a largely synonymous term also used. See Vipin Narang, ‘The Discrimination Problem: Why...


35 Rutland Island in the Andaman and Nicobar Islands and Assumption Island in Seychelles are small: areas of 121 and 11 square kilometres respectively.

36 Some in Pakistan, however, have made the unproven assumption that India’s Prahaar short-range (150-km-range) ballistic missile is under development as a nuclear-delivery system. See, for example, Zahir Kazmi, ‘SRBMs, Deterrence and Regional Stability in South Asia: A Case Study of Nasr and Prahaar’, Institute of Regional Studies, Islamabad, October 2012, https://www.academia.edu/6596900/CONTENTS_Introduction_1_SRBMsdeterrence_and_regional_stability_in_South_Asia_A_CASE_STUDY_OF_NASR_AND_PRAHAAR.

37 Joshi and O’Donnell, India and Nuclear Asia, p. 25.
India and Pakistan are slowly developing advanced technologies that could change their overall nuclear-weapon postures and affect strategic stability if they were introduced into their military inventories. These efforts, which are largely concentrated on delivery means, reflect global trends towards larger arsenals, more mobility (ballistic missiles), more sophistication (cruise missiles) and generally more payload ambiguity or higher speeds. Efforts pertaining to nuclear deterrence are principally directed at basing nuclear weapons at sea on-board naval platforms in the Indian Ocean. The momentum which affects the research and development, as well as industrial and force structuring relating to these emerging technologies, is separate from that relating to existing capabilities (see Chapter Three).

Technology has been central to nuclear strategy since the advent of nuclear weapons in the 1940s. Its impact, positive or negative, on strategic and nuclear stability is context-dependent and can therefore change. During the Cold War, the introduction of new technologies by the US and the Soviet Union stabilised nuclear deterrence between them overall, fostering, for instance, missile-defence arms control (the 1972 US–USSR Anti-Ballistic Missile Treaty) or prompting the other side to catch up and, after some time, neutralise the first country’s narrow advantage. On the flip side, new technologies complicated crisis management and fostered arms racing. India and Pakistan could face a similar dilemma, exacerbating their already troubled relationship since they became overtly nuclear-armed in 1998.

4.1 Sea basing nuclear weapons: intent and efforts

India aspires to ‘continuous-at-sea deterrence’ (CASD), that is, the ability to retain in the long term at least one submarine on deterrence patrol with nuclear weapons ready at any time to credibly target both Pakistan and China (see Figure 14). This strategy is designed to provide India with a secure ability to retaliate in the event of a first nuclear strike by either of its two potential adversaries. India’s effort is focused on the acquisition of nuclear-powered submarines able to launch nuclear-armed ballistic missiles (SSBNs).

The Indian Navy’s inventory currently only includes one SSBN type, with more being built. In November 2018, India’s SSBN, the Arihant, carried out its first ‘deterrent patrol’, in an undisclosed area of the Indian Ocean, marking the culmination of a 30-year national effort. Related defence-industrial and infrastructure-development work to create a sea-based nuclear deterrent include a land-based command-and-control system; submariners trained on foreign nuclear-powered attack submarines (SSNs) for more than a generation; a capability to produce highly enriched uranium, plutonium and other materials for naval reactors; and short-range, submarine-launched nuclear-capable missiles with a fusing warhead.

India is closer to having a secure sea-based second-strike capability than Pakistan. Officially, India claims the November 2018 patrol completed ‘the establishment of the country’s survivable nuclear triad’. Yet this is at best premature and well below the ‘secure-second-strike’ criteria: the Arihant’s 750-km-range K-15 ballistic missiles can currently only target the Pakistani coast, at the risk of being hit by pre-emptive fire against the ship. Furthermore, one submarine does not make an effective deterrent. Middle-range operators of sea-based nuclear deterrents such as France or the UK deem that three or four boats are necessary for CASD. India will need time to reach, let alone exceed, such numbers.
The next submarine, which was launched for sea trials in 2017, is expected to be commissioned into service in 2022. Two others will follow but this is only likely to happen from the middle of the decade. There is no official timeline for others. A 3,500-km-range K-4 submarine-launched ballistic missile (SLBM) could enter service by the mid-2020s. This could result in delays to reported even-longer-range sub-surface-launched missiles in development, which mirror the land-based Agni series. So even by the end of this decade, India is likely to require a ‘bastion’, that is, a protected loitering zone for its SSBNs, in the Bay of Bengal. For all these reasons, the Arihant is therefore something of a test bed. Many Indians are sober about the task ahead, including in the navy, whose leadership is focused on creating an oceanic conventional force (including nuclear-powered attack submarines) with otherwise limited resources to counter China in the Indian Ocean region. Several reported accidents have also raised concerns about safety and reliability. Yet India’s direction of travel is clear.

‘India’s first indigenously built nuclear propelled strategic submarine named “Arihant” meaning “Destroyer of the Enemies” was launched today, 26 Jul 09, at the Ship Building Center, Visakhapatnam. India has thus joined a select group of nations which have the technological capability to build and operate nuclear propelled submarines.’

INDIA: Ministry of Defence, 26 July 2009

‘Deterrence is provided at both nuclear and conventional levels, including in the maritime domain. The Indian Navy will contribute to national deterrence strategy. … India is developing sea-based nuclear deterrence, in accordance with its nuclear doctrine. The Indian Navy will operate the SSBN to reinforce nuclear deterrence, supported by corresponding operational capabilities and procedures for optimal deployment, in keeping with national policy.’

INDIA: Maritime Security Strategy, 23 October 2015

‘The submarine recently returned from its first deterrence patrol, completing the establishment of the country’s survivable nuclear triad … [The Prime Minister] stress[ed] the significance of the successful deployment of INS Arihant for the completion of India’s nuclear triad … [India] has transformed scientific achievement of nuclear tests into establishment of an immensely complex and credible nuclear triad, and dispelled all doubts and questions about India’s capability and resolve in this regard.’

INDIA: Prime Minister’s Office, 5 November 2018
Compared to India, Pakistan’s intent regarding sea-based nuclear deterrence is less definite, with ambiguous expressions of both assertiveness and minimalism. But Pakistan is slowly developing the elements that, if combined, could amount to a sea-based nuclear-weapon capability. Even a token capability would, owing to its crudeness, pose inherent risks. Pakistan’s FSD definition could yet include the maritime domain. Analysts who are convinced that Pakistan may already have nuclear-tipped missiles on some surface ships are rarely found outside India, although Pakistan created a headquarters for its Naval Strategic Forces Command in 2012. In 2017, Pakistan test-launched a 450-km-range Babur-3 cruise missile from an underwater platform, announcing that it had thereby proved it was on the way towards a ‘credible second-strike capability’. Pakistan is unlikely to achieve a true submarine-launched cruise-missile capability in the near future. In 2015, it placed an order for eight Chinese diesel submarines with air-independent propulsion technology, which allows the boats to stay submerged for longer periods than other diesel–electric propulsion but for far shorter periods than nuclear-reactor ones. The Chinese submarines (known in Pakistan as the Hangor class), four of which are to be built in Pakistan, will not be available until at least 2022. In the meantime, a torpedo-tube launch configuration of the Babur-3 may afford Pakistan compatibility for testing with diesel–electric submarines, including the five currently in its inventory equipped with 550-mm-diameter tubes.

4.2 Risks to deterrence, crisis and arms-race stability

India’s and Pakistan’s existing land- and air-based second-strike capabilities have a stabilising effect on nuclear deterrence. Both countries could expect an additional stability dividend by placing nuclear weapons on sea platforms, if they were only designed for second strike. But this could be decades away. Early progress has been limited and comes with an identifiable family of risks relevant to both countries and compounded by current levels of secrecy and ambiguity. Weaker India–Pakistan deterrence stability overall and in crisis situations, as well as more arms racing, are likelier in the coming years as a result.

Deterrence stability

Little is known of India’s and Pakistan’s respective command-and-control policies at sea. As the credibility of nuclear-deterrence patrols is a function of discreet submersion over large distances, two-way communication between a submarine and the land-based political leadership is restricted in peacetime. During crises, completely disrupted communications could disallow firing missiles whose security systems require external authorisation. This raises a delegation risk. In such a situation,
delegation to commanding officers on-board would be necessary. Such uncertainty clouds confidence both in the opponent’s resolve and in overall deterrence.

In India, delegation is a sensitive question and is rarely openly discussed. The country has set itself a tall order of permanent, land-based civilian control of its deterrent as part of a wider institutionalised civil–military status quo. Even if some analysts contrast India’s and Pakistan’s situations, Pakistan’s dilemma is similar: the NCA Employment Control Committee headed by the prime minister exercises primacy. The delegation challenge could increase if Pakistan deployed nuclear weapons on-board naval vessels without having redundancies to its single-known very-low-frequency (VLF) communications facility near Karachi. India is understood to have redundant very- and extra-low-frequency one-way transmitters. Quantum encryption and satellite-based relays may relieve both countries of some of the challenge. But in the region this technology will likely mature more slowly than the ability to place nuclear weapons on naval platforms. The central question would remain whether Indian and Pakistani leaders, in the last resort of severed communications, would trust their submariners.

Crisis stability

At sea, the discrimination problem (see Chapter Three) could pose a double risk to crisis stability. The first discrimination challenge concerns nuclear weapons being carried by conventionally powered submarines. Without an SSBN programme, Pakistan’s only option to operationalise a deterrent at sea would be to place nuclear weapons on conventionally powered ships, most likely submarines. This could complicate India’s calculations of proportionate use of force in a crisis involving a blockade by its navy coupled with a robust anti-submarine campaign. Dangerous escalation could follow India unintentionally hitting a Pakistani submarine carrying nuclear weapons because Pakistan may conclude that its strategic assets had been attacked.

The other discrimination challenge at sea concerns incoming missiles in a crisis. Unable to identify the warhead of a dual-capable missile (cruise or ballistic) fired from a naval platform or destined for one, either side may guess and second-guess incorrectly. The current levels of distrust between the two militaries could be compounded by the confusion of crisis, robbing both sides’ leaders of the confidence to rule out, a priori, nuclear ordnance. There is an awareness of this problem regionally, but no agreement between India and Pakistan to address it. Pakistan’s deployment of the Babur-3 missile on any of its present or future diesel–electric submarines would present a discrimination challenge given its official dual-capable designation.

A separate risk to crisis stability originates from the higher readiness of nuclear weapons deployed on undersea platforms, making them more rapidly usable even in the event of misunderstanding or miscommunication, accidental launch or even a rogue captain. Once loaded onto submarines, nuclear warheads remain mated to their vertical-launch ballistic missiles. Since the early 2000s, there has been an understanding that neither country keeps its weapons systems ready for use in peacetime. This risk likely currently only concerns India. Pakistani officials variably describe this mating arrangement as a fact or at least a necessity, concluding that India is behaving irresponsibly by keeping missiles mated in this way. (Pakistan is not known to have responded by changing the readiness of any of its nuclear forces.) India’s command-and-control practice reportedly calls for the mating to take place on land at the first indications of a crisis, before the submarine heads out to sea, where undisclosed safety and security procedures, analysts argue, are in place. This leaves open the possibility that the boat could be at sea without nuclear weapons, thus raising a discrimination risk.

In February 2019, India’s naval strategic forces played an active role in a crisis for the first time. Pakistan claimed that India deployed the Arihant as part of early coercive moves at sea against Pakistan. A year later, Pakistan’s Lt-Gen. (Retd) Khalid Kidwai even speculated ‘whether India contemplated the use of nuclear weapons from a second-strike platform even before its first-strike options’. India has not denied the Arihant deployment. Corroborating commercial-satellite evidence has surfaced since. Other Indian Navy ships were reassigned to missions focusing on Pakistan, reportedly including a search for a Pakistani conventional submarine. It is not known whether Pakistan’s exceptional NCA meeting on 27 February 2019 discussed a nuclear maritime
dimension to the situation. As India’s sea-based deterrent grows, however, Pakistan will find it all the easier to allege nuclear coercion at sea by its rival in future crises. This will be to India’s detriment unless Pakistan unveils a complete naval-nuclear-weapon capability.

**Arms-race stability**

The slow pace of India’s nuclear-powered- and armed-submarine programme and lack of mirroring Pakistani step changes limits the risk of a surprise capability gap between the two countries (unlike between the US and the Soviet Union during the Cold War). Moreover, even before the pandemic, each country was aware of the other’s slowing rates of economic growth and the resulting defence-budget austerity likely to affect their nuclear-weapons-procurement road maps. The COVID-19 crisis is almost certain to entrench and accentuate those trends. Both countries face difficult choices about their plans to extend nuclear deterrence seawards. But neither is likely to change its broad strategic course.

Yet fewer funds or escalating full life-cycle costs could spell less predictability and more anxiety for both sides, especially if one felt compelled to both spend less and keep up with the other’s perceived naval nuclear plans. Both countries could be tempted to make compromises on safety or security in order to prove to the other that they have a credible capability. Finally, should Pakistan, whose economy is smaller and growing more slowly than India’s, have to downsize any existing plans to deploy any number of nuclear weapons on naval platforms, it may choose instead to place an even greater emphasis on its land-based second-strike nuclear weapons. Pakistan’s occasional claims to save costs by indigenising development and expertise are altogether unconvincing. It is also doubtful that Pakistan could afford to acquire SSBNs.

**4.3 Other technological efforts and possible risks**

Beyond the maritime domain, any overview of emerging strategic risks in South Asia is incomplete without a discussion of emerging developments in the space and cyber domains. New risks to nuclear deterrence stability will occur only if such capabilities become formally part of both countries’ military inventories and involve attacking or defending against the other’s military nuclear infrastructure. Short of this, these capabilities are at best prototypes or demonstrators in various stages of research, development or testing, with no actual impact on nuclear deterrence narrowly defined. However, they could affect strategic deterrence, of which nuclear weapons are only a dominant part. As such, advanced emerging capabilities require the sober judgement of professional analysts and planners to overcome simplistic worst-case scenarios and engineers’ claims appearing to alter the spirit or letter of nuclear doctrine, including India’s and Pakistan’s minimalism claims. Separately, the quest for such capabilities highlights the growing importance of China as a factor in India and Pakistan’s deterrence relationship.

**The space domain**

India’s introduction of working strategic missile defences could conceivably help diminish the impact of a limited, medium- or long-range-missile attack from Pakistan (or China). The introduction of even locally limited missile defence by India would alter the situation of mutual vulnerability between the two countries in a way that could weaken nuclear deterrence stability between them. Furthermore, Pakistan has never launched a strategic missile and India has never intercepted one outside its own tests, so the impact on crisis stability or escalation is unknown. Motivated by anxieties about both Pakistan and China, India follows three
pathways to missile defence. The most recent development is the decision in 2018 to purchase five regiments of the S-400 Triumph surface-to-air-missile system from Russia.\textsuperscript{46} Since the early 2000s,\textsuperscript{57} India has worked on two domestic programmes: the Prithvi Air Defence (PAD/Pradyumna) system for high altitude (max. 80 km) and the Advanced Air Defence (AAD) Missile for lower altitude (max. 30 km).\textsuperscript{48} Despite some successes, those systems unsurprisingly failed to meet their high-end objectives during testing, delaying any introduction into service. It is also unclear whether and how India’s indigenous and foreign systems could function together. Pakistani officials openly spurn missile defences on affordability and efficacy grounds.

India and Pakistan are also seeking to mount several nuclear warheads on a single ballistic missile (a technology generically known as multiple re-entry vehicle or MRV), posing a serious risk to deterrence stability. Given Cold War precedents, these efforts are unsurprising: each seeks to breach better and more cheaply the opponent’s defences in case they decided on nuclear strikes. This could require additional fissile material for the warheads, although existing stocks may allow for this (see Chapter Three). Pakistan first tested the Ababeel missile in January 2017, claiming it could carry multiple independently targetable re-entry vehicle (MIRV) technology.\textsuperscript{29} If Pakistan tested reliably and introduced the Ababeel into service, it would increase the overall size of the country’s arsenal, depending on the number of as yet undisclosed warheads the missile may carry.\textsuperscript{20} India also appears to be working on MIRV options for its longer-range Agni-series missiles. Other than statements by past defence scientists (about funded design work)\textsuperscript{31} and a recent head of strategic forces (on the aspiration),\textsuperscript{32} India has made no official announcement on MIRVs. There are reports that the 5,000-km-range Agni-V, which is due to enter the armed forces inventory in 2021, could be MIRV-capable. Indian analysts sometimes point to India’s successful record at placing multiple satellites in orbit from its civilian space launcher as evidence of a present capability of sorts. Adding this feature to its land-based mobile launchers, which would operate from deep within peninsular India, could further reduce the Agni-V’s vulnerability, as it seeks to target China’s eastern-seaboard cities, including Beijing and Shanghai. There has been speculation that India will mount the more advanced manoeuvrable re-entry vehicle (MaRV) technology for the longer-range Agni-VI currently in development but untested.\textsuperscript{33} The growth of China’s strategic missile defences could precipitate India’s efforts to achieve MRVs. All of India’s research in MIRV technology appears driven by concern about China and, given India’s NFU pledge, the possibility of it using a future MIRV capability for a first use is remote. Pakistan, on the other hand, could put MRVs to first use, given its nuclear doctrine (see Chapter Two).

In India, two high-profile demonstrator programmes among the country’s future-technology pursuits could disrupt nuclear deterrence stability if India matured them into actual military capabilities and identified circumstances for use against Pakistan’s (or China’s) nuclear intelligence, surveillance, target-acquisition and reconnaissance infrastructure. Firstly, India became the world’s fourth country to demonstrate an anti-satellite (ASAT) capacity in March 2019.\textsuperscript{34} Other than ‘defending [India’s] assets in space’ against ‘rogue satellites’ and intercontinental ballistic missiles (ICBMs),\textsuperscript{19} Indian officials have not detailed the strategic rationale for this test (or its underlying efforts),\textsuperscript{35} but they do not deny India’s intent to compare favourably with China as a technology competitor. India’s chief defence technologist has claimed an ASAT capability ‘beyond 1,000 km’\textsuperscript{36} Besides generating space debris, analysts have pointed to the limitations of India’s test.\textsuperscript{37} But the test has aroused Pakistani concerns given the country’s own growing reliance on (Chinese-launched) satellites, including for defence purposes.\textsuperscript{38} India and Pakistan do not have bilateral measures in place to avoid targeting each other’s satellites (although proposals to limit ASATs elsewhere have so far been unsuccessful).\textsuperscript{49}

Secondly, India’s civilian space organisation and ministry of defence have conducted flight tests of a missile-mounted experimental hypersonic vehicle. These are being developed and acquired elsewhere (including in China) to provide strategic conventional-strike options using high speed to defeat defences. India’s most recent attempt successfully took place in October 2020. There is no evidence of Pakistan seeking or researching such a hypersonic capability.
This comes amid nascent national debates in the region over the desirability of hypersonic weapons. They may have destabilising potential if they induce ambiguity about the target or payload or prompt the defendants to raise the alert levels of their own missile and strategic forces. The context of the Indian subcontinent adds to the challenges: regional analysts, not just from Pakistan, increasingly insist that any resort to hypersonic weapons between contiguous neighbours India and Pakistan could also have considerable strategic effects: the launch-to-impact interval would be so short that it could leave little to no time for the defending side’s leadership to assess and mitigate the threat. This confusion risk, along with destructive potential, may deter against use in the subcontinent. India has also never used its supersonic missile BrahMos against Pakistan. Use of a higher-speed missile first therefore looks unlikely in the near term.

The cyber domain

The possibility that India or Pakistan could use cyber weapons to disable or disrupt the other’s nuclear capabilities remains a far-off prospect. But both country’s militaries are acquiring both offensive and defensive cyber capabilities outside the nuclear-weapons domain as part of their modernisation plans. These could play a part in an escalatory pathway leading to nuclear-weapon use. The momentum in India for the formation of a joint cyber force is driven by consideration of China, but any such capability could be turned against Pakistan as a ‘non-kinetic’ option alongside use of other military force. Little is known about India’s or Pakistan’s cyber military doctrines, actual capabilities or operations. But both country’s efforts can be assumed to be directed at least in part towards the other. As in most other nuclear-armed states, however, India’s and Pakistan’s respective nuclear command-and-control infrastructure is kept separate from other networks, offering both harder and better identifiable targets for cyber measures, ultimately enhancing the reliability of nuclear command and control. In Pakistan, military-led cyber-defence and -security capabilities are partly located in the SPD. In India, there is growing public awareness that using cyber means to compel Pakistan below the nuclear threshold could risk uncontrollable escalation.

Relatedly, there is early evidence of India’s and Pakistan’s interest in acquiring national artificial-intelligence (AI) capabilities for defence purposes. In 2019, India’s defence minister announced a road map to develop 25 AI products for national security by 2024. In 2020, he mentioned AI as part of key technology trends in a speech marking one year since the February 2019 security crisis. Pakistan inaugurated a facility for applying AI to air-force operations in 2020. While AI may feature in both countries’ future conventional operations, neither country is likely to rely heavily on AI to assist decision-making for some years. At present, no evidence or reports link AI to either country’s nuclear weapons.

4.4 Concluding observations

- India’s effort to build a sea-based assured credible second-strike capability is slowly creating a new regional strategic reality, especially since its first deterrent patrol in 2018. Pakistan could follow using conventional ships, which, while more affordable, may increase the risk of misperception. Nuclear deterrence stability in South Asia now requires consideration of the reality and perception of action–reaction cycles in the much wider Indian Ocean region. This theatre – far larger than the Indian subcontinent – is characterised by the growing presence of the navies of all five established nuclear-weapons states. As India’s sea-based deterrent grows, Pakistan will find it all the easier in future crises to allege nuclear coercion at sea by India.

- India and Pakistan have also embarked on research and development in the space and cyber military domains, with a bearing on nuclear deterrence. Any resulting nuclear- and non-nuclear-threshold capabilities carry risks to nuclear deterrence; they could participate in precipitating crisis escalation unintentionally, encourage arms racing and, in Pakistan’s case, lead to greater reliance on its nuclear weapons.
Taken separately, these emerging developments may appear deceptively manageable because they are slow-moving and at early stages. Except for India’s SSBNs, no new capabilities are formally entering military service and being explicitly directed against the other’s nuclear arsenal. But taken together, the strategic whole is greater than the sum of the parts.

Since before India’s and Pakistan’s 1998 nuclear tests, South Asia’s strategic stability has been the product of actual capabilities, perceptions of those by the other side and anticipations of future potential capabilities. Missile flight tests, for example, more often denote immature capabilities. That fact can be overshadowed by reading too much into how the timing of such tests relates to the bilateral political–diplomatic context of the moment. Given the emerging, technology-led developments, this interplay will continue, sustaining old anxieties or raising new ones.

Most analysts in the region acknowledge the risks from emerging, technologically driven developments. But in both countries, the legitimisation of such national efforts is primarily established as a response to the opponent’s own efforts (and in India’s case, there is additionally the growing consideration of China). The belief is also entrenched in the region that nuclear deterrence is strong enough for lower-level or temporary instability to be bearable, as India and Pakistan progress towards secure second-strike capabilities. By this logic, their deterrence relationship would stabilise with time as that of other nuclear-armed states did before them. The ambivalent role of technology in the evolution of relationships between other, older nuclear powers may also give some well-placed assurance that greater instability can somehow be successfully managed reactively and pragmatically in South Asia.

Yet if greater instability from emerging technology-driven trends is likely and to be managed, it will require ever more high-level policy attention and separation of fact from mere perceptions. As an alternative, it may be less costly to safely arrest or alter the course of such emerging trends now, rather than once they overdetermine the cost–benefit analysis of options in a future crisis. Such thinking based on counter-anticipation is not new: soon after 1998, analysis from outside the region had encouraged thinking of alternative pathways to weaponisation, including to reduce risk.

Seeking and reaching negative security assurances at sea may be a useful step: could, for example, assurances be exchanged to avoid crisis-escalation anxieties related to naval platforms?


10 For other nuclear navies, delegation covers at least three different types of arrangements, details of which are often unknown: the submarine has the physical – but not legal – ability to launch nuclear weapons even without a valid order; the submarine has launch authority in extreme circumstances with specific guidance (e.g., letters-of-last-resort type instructions); or the submarine has full launch authority, whereby the submarine commander can do as he sees fit. See also Jeffrey G. Lewis and Bruno Tertrais, ‘The Finger on the Button: The Authority to Use Nuclear Weapons in Nuclear-Armed States’, CNS Occasional paper, no. 45, February 2019, pp. 24–9, https://www.nonproliferation.org/wp-content/uploads/2019/02/Finger-on-the-Nuclear-Button.pdf.


13 Neither side has nuclear weapons on-board potentially vulnerable surface ships. Since 2004, India has used surface ships as test beds for the 350-km-range Dhanush nuclear-capable ballistic missile. The last such test occurred after the Arihant submarine entered service, but before the SSBN’s first official deterrent patrol. Pakistan has not made such tests from surface ships. See ‘“Dhanush” ballistic missile successfully test-fired’, DD News, 24 February 2018, http://ddnews.gov.in/sci-tech/%E2%80%990dhanush%E2%80%99-ballistic-missile-successfully-test-fired.

14 Some but not all of the risk could be mitigated through observation by India of the likely single, identifiable onshore point where warheads would be loaded onto submarines.

15 For India, see, for example, Abhijit Singh quoted in Hundley, ‘India and Pakistan are quietly making nuclear war more
likely’. For Pakistan, see, for example, briefing by Captain Aqeel Akhtar, Visiting Research Fellow for South Asia (Strategic Affairs), IISS, 24 January 2019, London, https://www.youtube.com/watch?v=noDxRt59GOs.


18 ‘Keynote Address and Discussion Session with Lt-Gen. (Retd) Khalid Kidwai’.


22 For India, see, for instance, Roy-Chaudhury and Solanki, ‘India: defence spending and procurement’, pp. 166–82.

23 The UK’s national auditor, for example, estimated in 2019 that the cost of disposing of each of ten nuclear-powered submarines taken out of service amounted to US$125m alone; see ‘Nuclear submarines: MoD criticised over submarine disposal’, BBC News, 3 April 2019, https://www.bbc.co.uk/news/uk-47792539.


34 Government of India, Ministry of Defence, ‘India Joins Select
Group of Nations, Destroys Live Satellite in Low Earth
asp?PRID=1569563.

35 Government of India, Ministry of Defence, ‘Postage Stamp
Released on A-SAT: India’s First Anti Satellite Missile’,
asp?PRID=1654607; and Government of India, Ministry of
Defence, ‘DRDO at Republic Day Parade 2020’, 26 January

36 Office of the Defence Minister of India (@DefenceMinIndia),
‘Raksha Mantri Shri @rajnathsingh inaugurated the Anti
Satellite Missile Model during his visit to @DRDO_India
twitter.com/DefenceMinIndia/status/1325755129484570624.

37 ‘Interview: Secretary, department of defence R&D and
chairman, Defence Research and Development Organisation, Dr
terview/secretary-department-defence-rd-chairman-defence-
research-development-organisation-dr-g-satheesh-reddy/.

38 Ashley J. Tellis, ‘India’s ASAT Test: An Incomplete
Success’, Carnegie Endowment for International Peace, 19
india-s-asat-test-incomplete-success-pub-78884.

39 Inter-Services Public Relations Pakistan, ‘Press Release’,
php?id=1668; and SUPARCO, ‘Press Release: Pakistan’s First
National Communication Satellite Launched Today’, 12

40 Timothy Wright, ‘Do ASATs mean less security in
space?’, IISS Military Balance blog, 17 March 2020,
https://www.iiss.org/blogs/military-balance/2020/03/
india-anti-satellite-weapon-space-security.

41 Prashasti Singh, ‘India successfully test-fires nuclear capable
hypersonic missile Shaurya’, Hindustan Times, 3 October
2020, https://www.hindustantimes.com/india-news/india-
successfully-test-fires-nuclear-capable-hypersonic-missile-
shaurya/story-6OVLTt6uXuevQpKKnuiuxXG.html; Manpreet
Sethi, ‘The hype over hypersonics’, Hindu, 27 January 2020,
https://www.thehindu.com/opinion/op-ed/the-hype-over-
hypersonics/article30659477.ece; and Nagal, ‘India’s Nuclear
Doctrine and Strategy’, p. 221.

42 A rare high-profile recent example was the Pakistan military’s
public attribution to ‘Indian intelligence agencies’ of what it
called a ‘major cyber attack’. See Inter-Services Public Relations

43 Sidharth Kapoor, ‘Not a bloodless option for India’, Hindu,
4 July 2019, https://www.thehindu.com/opinion/op-ed/not-a-bloodless-option-for-india/article28275541.ece; see also
M.K. Narayanan, ‘The best among limited options’, Hindu,
lead/The-best-among-limited-options/article14990381.
ece?homepage=true.

44 Government of India, Ministry of Defence, ‘India to achieve
USD 26 Billion Defence Industry by 2025: Raksha Mantri’,
asp?PRID=1585366.

45 Government of India, Ministry of Defence, ‘Balakot airstrikes
was a message that cross-border terrorism will not be a low-
cost option for the adversary, says Raksha Mantri Shri Rajnath
Singh’.

46 ‘Air Chief inaugurates Center of Artificial Intelligence &
Computing in Islamabad’, Radio Pakistan, 27 August 2020,
https://www.radio.gov.pk/27-08-2020/air-chief-inaugurates-

47 For details of extensive testing the UK deterrent underwent,
see, for instance, ‘Operational Selection Policy 11 – Nuclear
information-management/osp11.pdf.

48 Synnott, The causes and consequences of South Asia’s nuclear tests,
5. Nuclear stability, risk reduction and confidence

The current and future risks relating to existing capabilities and emerging technology-driven developments identified in the two previous chapters add to the earlier worries raised by assessing India’s and Pakistan’s doctrines. This chapter examines what, if anything, can be done to address and minimise those risks, assuming that negotiated arms control is unlikely in the short or medium term. If achieving trust is also too tall an order, it may at least be possible to enhance confidence. This will require the pursuit of CBMs and other options to address the risks arising from mistrust and misperceptions. This chapter will focus on nuclear and military CBMs, outlining existing measures, assessing their utility and offering suggestions for enhancing the India–Pakistan CBM regime.

5.1 Confidence-building measures: promise and stagnation

CBMs remain a tool of first choice to promote trust or at least help dispel mistrust and misunderstandings within the context of the nuclear-deterrence relationship. Nuclear and military CBMs between India and Pakistan have a long history (see Annex 4), but the implementation of some has been patchy and agreed channels of communication have often been neglected during crises. The two countries have also explored various ‘civilian’ CBMs such as people-to-people contacts, commercial connections and diplomatic exchanges. Although helpful in the broader bilateral relationship, such measures are unlikely to affect the core dynamics shaping nuclear deterrence and its weaknesses in the region.

Nuclear and military CBMs can be beneficial in addressing the lack of transparency between the two militaries. Such CBMs can supplement unilateral statements, enhancing understanding of intent, which is central to nuclear doctrine, as well as establish routinised channels of communication. They can help reduce misperceptions by introducing a level of transparency that is comfortable to both sides. At present there is almost no formal contact between the military establishments of India and Pakistan. Other than the presence of defence advisers in each capital there is no mutual exercise observation, no staff talks or visits, no staff college exchanges, sporting events or other means of interacting. In contrast, by the end of the Cold War, the Soviet Union and the US had achieved levels of mutual military transparency unthinkable only two decades earlier. This was accomplished through political will borne out of realism and pragmatism, a prospect that is worth consideration for India and Pakistan.

Flaws, gaps and challenges notwithstanding, given the requisite political will, the extant suite of India–Pakistan CBMs provides a foundation for reducing the propensity for confrontation and ‘lengthening the fuse’ in the event of a crisis. Though CBMs by themselves guarantee nothing, they may create firebreaks during a crisis, allowing time for diplomacy to interrupt a spiral into conflict. Moreover, the process of consultations involved in implementing and evaluating CBMs on a periodic basis in times of normal levels of tension would, at a minimum, provide an invaluable mechanism for increasing understanding, reducing suspicions and, ultimately, enhancing stability.

The key India–Pakistan military CBMs currently in place resulted from serious crises in 1986–87 and 1990 in which military movements raised fears of surprise attack. In April 1991, in the aftermath of these experiences, the two sides agreed to a set of measures intended to prevent airspace violations, to provide prenotification of military exercises and to revive a telephonic
hotline between the two Directors General of Military Operations (DGMOs) in the respective army headquarters. These agreements have been largely successful in reassuring each side and in limiting, if not eliminating, the concerns about surprise attack that were previously associated with large military training exercises.

The two sides subsequently developed a protocol to use the DGMO hotline every Tuesday to maintain contact and exchange routine information, but the line is theoretically available 24/7 and has occasionally been employed in unusual or emergency situations (including in February 2021). At the same time, the airspace and exercise agreements lack detail and verification mechanisms, making them subject to possible abuse, while the DGMO hotline is often shut down when it is most needed. During the February 2019 crisis for instance, the two DGMOs did not talk for several weeks despite the high level of tension and military action by both sides. Nor has the hotline link been very effective in curbing the dramatic increase in ceasefire violations along the LoC since 2013. A hotline connecting the two foreign secretaries has no schedule for regular calls and has seemed moribund in crises.

In addition to strictly military CBMs, India and Pakistan have developed several agreements specifically related to missile and nuclear issues. The most enduring and rigorously observed of these is the 1988 Agreement on the Prohibition of Attack Against Nuclear Installations and Facilities, under the provisions of which India and Pakistan have undertaken not to destroy or damage the other’s installations and facilities (such as power and research reactors) either directly or indirectly. Both governments have been scrupulous in providing the required lists of facilities on 1 January every year. As the lists seldom change and are assumed not to include all possible targets of concern (especially those related to nuclear weapons), this agreement is now largely symbolic, but it is not insignificant that both parties have adhered to the exchange stipulation every year regardless of the state of bilateral relations (e.g., after the December 1999 hijacking of an Indian Airlines flight by Pakistani militants or in the wake of the November 2008 terror attack in Mumbai). Abandoning any of these measures would seriously degrade bilateral relations and alarm outside powers.

Beyond the 1988 non-attack agreement, a visit to Lahore in February 1999 by then Indian prime minister Atal Bihari Vajpayee produced a joint statement at the prime-ministerial level and a memorandum of understanding (MoU) – conjoined as the Lahore Declaration. Among other steps, this document called for ‘bilateral consultations on security concepts, and nuclear doctrines, with a view to developing measures for confidence building in the nuclear and conventional fields’ as well as ‘appropriate consultative mechanisms’ to ensure effective implementation. The Pakistan Army’s intrusion across the LoC later that year and the resultant Kargil War understandably halted progress, but the two governments subsequently concluded agreements on reducing the risk of accidents related to nuclear weapons (2007, extended in 2012 and 2017) and on the prenotification of ballistic-missile flight tests (2006); they also reaffirmed their moratorium on nuclear testing (2004). The foreign-secretary and expert-level talks conducted to reach these agreements constituted in themselves a significant instrument of nuclear confidence building.

**5.2 Possible avenues forwards**

Although the Lahore MoU is now over 20 years old, it and the ensuing bilateral agreements provide a foundation upon which the two sides can build to reinvigorate and expand their existing CBM regime. The potential list of new or enhanced measures regarding nuclear weapons and their delivery means is rich with opportunities, especially as some steps would merely require the modification of existing agreements to account for recent developments in technology and doctrine. Possibilities the two sides could consider include but are not limited to the following:

**Modernise the 1988 non-attack agreement**

- Add very-low-frequency/extremely low-frequency (VLF/ELF) transmitting stations to the list of facilities not to be attacked. As the two sides are in the process of extending nuclear deterrence seaward, VLF/ELF communications will be crucial to ensuring proper command and control. Placing these transmitters on the respective non-attack lists would thus help
address concerns about unauthorised use of submarine-launched nuclear weapons.

- Agree that such facilities will be avoided during conventional conflict.

- Expand the agreement to cover major civilian-infrastructure targets (such as large dams), the destruction of which would result in environmental and humanitarian catastrophe.

- Add ‘a mechanism to share information about terrorist threats to facilities covered by the agreement’.

- Add a provision to prevent cyber attacks on the listed facilities.

**Add cruise missiles to the ballistic-missile-testing prenotification agreement**

Both countries are actively developing and deploying arsenals of cruise missiles, some of which have or could have nuclear warheads. India and Pakistan closely watch each other’s missile activities, so including cruise missiles in the prenotification regime would reduce the suspicions and concerns that often surround live testing. Notification could also include when multiple launches are planned (these are currently permitted within the notified window without prior announcement). Similarly, the two sides could agree not to conduct any missile tests whatsoever during periods of heightened tension or crisis, as tests are seen as designed to intimidate the opponent.

**Other measures**

- **Formally announce the withdrawal of outdated, nuclear-capable short-range ballistic missiles from service**, specifically the older Indian Prithvi-I and Pakistani Hatf-1 systems, which have not been tested in at least the last 15 years. Both sides will eventually need to retire these weapons in any case and could make a virtue of necessity by doing so transparently according to a jointly agreed schedule. A dialogue about how to exchange relevant evidence about decommissioning these systems would be a valuable contribution to reducing mutual suspicion.

- **Establish one or more nuclear risk-reduction centres (NRRCs)** that would be jointly manned on a 24/7 basis. As detailed in a 2004 study, one or more NRRCs would provide each party with a dedicated, secure means of notifying the other about activities that might be misinterpreted; a channel for exchanging information as agreed in existing security arrangements; and a forum for clarifying ambiguous events on the territory of the other side. NRRCs could also be platforms for consultations on the implementation of existing CBMs. The NRRC idea is ambitious and some analysts caution that ‘attempting to establish an NRRC-like structure could be a recipe for failure’. However, such an institution could be envisaged as the ultimate goal with perhaps an enhanced ‘hotline-plus’ communications link connecting key nuclear organisations (such as a branch of each national command authority) as an interim measure. The hotline-plus arrangement could also include an exchange of liaison officers to reduce the risks of misperception.

- **Conclude a bilateral agreement on MIRV warheads and ballistic-missile-defence (BMD) deployments** designed to curb unbridled nuclear development that is more ostentatiously driven by technology rather than by policy or doctrine (see chapters Three and Four). This is also an ambitious proposition. The Indian decision to purchase Russian S-400 Triumph systems complicates any such proposal. But as several Indian, Pakistani and international observers have suggested, the two could consider limitation options that would build confidence and reduce costs.

- **Conclude an incidents-at-sea agreement.** India and Pakistan have discussed this before, but have never reached a formal agreement.
Such an agreement would likely not address nuclear weapons at sea, but institutionalising procedures to reduce the possibility of maritime accidents and misunderstandings would be very beneficial and would establish routinised channels of communication to enhance understanding and transparency.

■ Join the existing multilateral arrangement on fissile-material confidence building to facilitate multilateral information-sharing and promote best practices for the safe and secure management of civilian plutonium stockpiles’ through the International Atomic Energy Agency (IAEA)’s 1998 Guidelines for the Management of Plutonium. In practice, however, if both countries joined, the step would only affect India since Pakistan has no civilian plutonium. The measure would also not apply to either country’s military plutonium stocks.

■ Establish cooperative border-management measures to interdict possible illicit trafficking in nuclear or radiological materials. Such an agreement could be part of a comprehensive, written and institutionalised enhancement of border-management procedures.

■ Activate and sustain a dialogue on strategic issues between Indian and Pakistani think tanks affiliated with their respective governments. An agreement for such exchanges was signed in 2008 between India’s Manohar Parrikar Institute for Defence Studies and Analyses and Pakistan’s Institute for Strategic Studies Islamabad, but the proposed exchanges never occurred. A forum of this nature could address issues that are too sensitive for discussion in formal government-to-government meetings and could produce joint studies that inform official deliberation as well as broader public debate in each country. It could also assist in publicising informed discussion about nuclear weapons beyond New Delhi and Islamabad’s small ‘strategic enclaves’. Recognition of the need for education of the wider public about the implications of nuclear weapons is growing in the region.

The topics for such dialogues are many: the effects of nuclear detonations specific to South Asia in both a regional and global context; the utility of transparency measures such as ‘open-skies’ proposals on joint employment of remote-sensing technologies; future CBMs or arms-control opportunities; and respective terminologies relating to nuclear- and missile-related behaviour, doctrines, force structures, nuclear safety and security, reassurance on alert levels, targeting questions, cyber threats or the effect of advanced conventional weaponry.

5.3 Overcoming challenges
The path to strengthening India–Pakistan CBMs is not an easy one. Obstacles include suspicion about CBMs in general – in particular, a perception that accepting a CBM is somehow equivalent to granting a concession to the enemy. CBMs can also be seen incorrectly as a discussion intended primarily to assuage the concerns of foreign audiences rather than serving genuine national interests. Furthermore, what outsiders regard as ‘no-risk, high-gain arrangements’ can easily be seen as ‘low-gain, high-risk arrangements’ by politicians in New Delhi or Islamabad. The few serving or retired personnel with relevant experience can also suffer from a degree of ‘CBM fatigue’, as they see little progress after two decades of discussion and occasional agreement. For others, particularly those involved in politics or everyday foreign- and defence-policy matters, nuclear confrontation may appear worrisome but so unlikely as not to warrant excessive investment of time and attention.

At the same time, a pro-nuclear cacophony frequently drowns out those who advocate nuclear sobriety, minimalism and even sufficiency, especially in times of crisis when emotions can run high on both sides and worst-case analysis prevails. At a deeper level, many in the region use ‘trust deficit as an excuse’ to reject CBMs. Trust can be seen as a necessary precondition for engaging in confidence building, but this is to misunderstand the purpose of CBMs, which is to actually lay a foundation upon which trust may be constructed.
While any nation engaged in a CBM process must reconcile legitimate concerns about secrecy with the promotion of stability, there are at least two challenges in the India–Pakistan case. First is the role of China: Pakistan’s principal ally is a rival and perceived as a growing security threat in India, imposing demands on India’s nuclear and conventional armaments. China’s presence thus complicates the development of bilateral India–Pakistan CBMs: it creates linkages to the wider Indo-Pacific frame of reference at a time when major powers’ emerging corresponding strategies can appear to underplay the relevance of India–Pakistan nuclear deterrence stability and its challenges.

Second is the challenge of crafting a suite of nuclear and missile CBMs in a situation of conventional asymmetry and sub-conventional warfare. This challenge explains why Pakistan has failed, since 1998, to convince India to adopt a ‘strategic restraint regime’ as both a set of practical proposals and a mindset. Even if many in Pakistan exaggerate the conventional disparity, the two sides must decide when/how to disaggregate nuclear and conventional military CBMs and when/how to combine them to mitigate the dangers of nuclear confrontation. Finally, the two governments must determine the best mix of incremental improvements and high-profile political or military gestures to promote CBMs. Attuned to but not irredeemably trammelled by their respective domestic political scenes, New Delhi and Islamabad would have to promote CBMs not only within their broader polities, but also within the bureaucratic and military institutions that will be charged with sincere and rigorous implementation.

5.4 Concluding observations

- An often-unsung achievement of successive governments in both India and Pakistan has been the seriousness and consistency with which they have upheld CBMs agreed either before their 1998 nuclear tests or just afterwards. The contribution of those pre-existing and persisting CBMs to nuclear deterrence and stability cannot be overstated. The longer they persist, the greater the concern would be if any were abandoned.

- Yet a new set of military and nuclear CBMs is needed. New agreements are required to update or complement older ones in a framework of mutual confidence or comprehension between the two countries’ top leaders first. The purpose of such a framework would be to minimise risk – both assumed and inadvertent – and strengthen nuclear deterrence by providing both a renewed letter and spirit for strategic confidence through greater transparency and communication.

- Considerable political will on both sides will be critical to establishing new bilateral CBMs. Political will from the top communicated with as little rhetoric as possible, through bureaucracies and militaries on both sides, could make CBMs a prelude to and component of a resumption of bilateral political dialogue. The armed forces on both sides have repeatedly demonstrated the ability to undertake challenging tension-reduction tasks (such as implementing ceasefires or withdrawing from forward positions) in a professional manner when they have governmental instruction and backing to do so. Without such political will, any stand-alone official dialogues pertaining to defence doctrines and related nuclear issues will be impossible.

- Until such talks take place, the two governments can consider using, reinvigorating or expanding existing measures to manage the current high levels of tensions across the Kashmir LoC, in nuclear issues and in the broader relationship. One or the other may find it helpful to implement creative unilateral CBMs to initiate a virtuous cycle of stability even if officials in the region are sceptical. These could include reaffirming commitment to the existing moratoria on nuclear testing. They could also include concentrating on avoiding accidents rather than on arms reduction or limitation, which are foreseeably unpalatable to both countries.


One measure occasionally taken is to invite the other’s in-country defence adviser to military exercises as observer alongside other foreign-military diplomatic colleagues. Although this is not directly relevant to nuclear deterrence, it helps promote contacts between militaries, which overall can help dispel institutional mistrust. See, for instance, more recently and symbolically, Kamran Yusaf, ‘In a first, Indian diplomats attend Pakistan Day parade in Islamabad’, Express Tribune, 23 March 2018, https://tribune.com.pk/story/1667651/1-first-indian-diplomats-attend-pakistan-day-parade-islamabad/.


The 1986–87 ‘Brasstacks Crisis’ is named after the Indian army exercise that sparked it.

A hotline had been established after the 1971 India–Pakistan war, but had fallen into disuse.


The hotline was used during the 2005 earthquake in Pakistan; see Government of India, Ministry of External Affairs, ‘On India–Pakistan Foreign Secretary Level Talks in New Delhi’, 17 January 2006, https://www.mea.gov.in/media-briefings.htm?dtl/2730/on+indiapakistan+foreign+secretary.


Ibid.


26 Dalton, ‘What’s the Future of CBMs in South Asia?’ India’s Global Centre for Nuclear Energy Partnership and Pakistan’s Centre of Excellence and Nuclear Security may be able to envisage some form of limited cooperation, to this effect or more likely, as a result.


30 Comparing and contrasting national lexicons of nuclear strategy over time, as national capabilities evolve, can help narrow doctrinal misunderstandings. Distinctions between terms such as ‘first strike’, ‘second strike’ and ‘first use’ are
reliably mutually understood by India and Pakistan. Others come too close to red lines as ambiguity plays an active part in deterrence and definitions risk entailing permissiveness under a certain threshold. But this can be part of wider efforts to establish the boundaries beyond which the two sides would not press threats. Discussion of what constitutes a ‘responsible’ nuclear state may provide groundwork to such discussions. See Sebastian Brixey-Williams and Nicholas J. Wheeler, ‘Nuclear Responsibilities – A New Approach for Thinking and Talking about Nuclear Weapons’, British American Security Information Council (BASIC) / Institute for Conflict, Cooperation and Security (ICCS) Report, 1 November 2020, https://basicint.org/report-nuclear-responsibilities-a-new-approach-for-thinking-and-talking-about-nuclear-weapons/.


33 For Pakistan’s perspective, see discussion segment in ‘Keynote Address and Discussion Session with Lt-Gen. (Retd) Khalid Kidwai’.


35 Kulkarni, ‘India–Pakistan CBMs: A New Approach’.

36 ‘Track-1.5’ dialogues involving serving government or quasi-government officials meeting to discuss difficult issues can also help build or sustain trust.


40 In 2019 for example, such rhetoric was particularly sharp, even personal, between the prime ministers of India and Pakistan.
Summary conclusions and recommendations

This primer examines nuclear deterrence and stability in South Asia by separating perceptions from facts in order to assess the risk of India and Pakistan using nuclear weapons as a result of deliberate, separate steps seeking, but ultimately failing, to avoid that outcome. In doing so, its authors hope to have demonstrated that this subject matter, important though rarely urgent, is neither too difficult nor too secret to explore. It may even embolden regional political leaders to embrace their responsibilities at the helm of their nuclear-armed states, for their countries’ sake above all.

The primer finds 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. At its core, the evidence assembled suggests 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.

The argument starts from an examination of the utility of nuclear doctrine and the desirability of strategic stability. This enables an assessment of India’s and Pakistan’s nuclear doctrines. From this foundation, centred on India’s and Pakistan’s intent to defend themselves with nuclear weapons, it is possible to identify some of the risks presented by both sides’ existing military capabilities and by emerging technological developments, especially in the maritime domain. The closing discussion introduces possible avenues for preserving nuclear deterrence and preventing unintended nuclear risks through renewed confidence building.

Chapter One uses a universal perspective about nuclear deterrence to affirm the usefulness of nuclear doctrine since the Cold War. Nuclear doctrine carries weight and should be respected not least for its ability to communicate clearly to opponents a set of foundational stances concerning how a state views nuclear weapons and the circumstances under which it would consider using them. To domestic and other foreign audiences, doctrine also carries a message about how seriously nuclear-armed states would take breaking the taboo on nuclear use that has held since 1945. There is no indisputable yardstick for judging nuclear doctrine. It participates in but does not guarantee strategic stability: the notion of an equilibrium of tension resistant to disruption. Strategic stability, which includes crisis and arms-race stability, helps the avoidance of the risk of war. But it does not correspond to a single end state or end point. Achieving strategic stability requires constant tending and careful attention on a regular basis. This includes considering how the acquisition of new systems might bolster or undermine a deterrent relationship and the avoidance of provocative or short-sighted steps that might stoke instability or devalue the credibility of nuclear doctrine.

The second chapter places those universal considerations in the context of South Asia. A textual analysis of India’s and Pakistan’s nuclear doctrines finds that they are not symmetrical. The requirement for proportionality is undermined in that relationship even if Pakistan’s position, as stated in February 2020 at the IISS, is that nuclear weapons would only be used in response to ‘large-scale aggression’. This is compounded by a presumption of automaticity and overly optimistic assumptions about the management of nuclear escalation. The doctrinal disparity or inconsistency raises the real risk of miscalculation. The juxtaposition of India’s and Pakistan’s respective doctrines risks the possibility of a catastrophic nuclear exchange taking place at a time far short of extreme circumstances when national survival is at stake.
The third chapter examines how India and Pakistan have matched their military means across the spectrum of conflict to their statements of intent as defined in their doctrines. This starts with a necessary discussion of their conventional weaponry, which in a military escalation could establish a pathway to the nuclear threshold. Neither side has a significant qualitative edge even if India outdoes Pakistan by every measure of quantity. The nuclear weaponry of both sides is capable of inflicting unacceptable damage on the other. This obviates the need for much more. Both have a fledgling second-strike capability, but neither can launch a counterforce first strike with any assurance of success at present. Pakistan’s short-range, low-yield Nasr system and its stated desire to deploy missiles that reach every corner of India introduce new risks and cast doubt on claims of minimalism.

The fourth chapter concentrates on emerging capabilities. The development of new technologies can have both stabilising and destabilising effects on strategic deterrence. Possessing an assured second-strike capability at sea can be a contributing factor to stability. In India’s and Pakistan’s cases, this prospect is still far off: efforts to place nuclear weapons on maritime platforms are driven by India’s strategy and its road map, the design of which is clearer and the implementation faster than Pakistan’s. Pakistan could still seek a token deterrent at sea. At the same time, these two national efforts to create sea-based nuclear platforms pose risks to nuclear deterrence, of unintended crisis escalation, greater arms racing (despite the COVID-19 pandemic) and, in Pakistan’s case, greater reliance on its nuclear weapons. Trends in the cyber and space domains (including BMD, placing multiple warheads on a single missile, ASAT capacity or hypersonic missiles) are partly a reflection of India’s double challenge of ensuring stable deterrence towards both China and Pakistan. Sober analysis can identify which of these threshold capabilities may become viable military options. Until then both countries can gain from sharing understandings about which longer-term dangerous prospects it would be in their interests to avoid.

The fifth chapter assesses what more, beyond existing measures stabilising nuclear deterrence, can be done to address all these risks. If the prospects of outright arms control and building political trust appear too remote, adopting a new realistic and diverse set of military and nuclear CBMs could help build an up-to-date framework of understanding (see Figure 17). This remains true despite the inbuilt limitations of CBMs and their chequered history in South Asia. By relying, for example, on transparency measures, both countries could communicate their nuclear doctrines more clearly.

**Figure 17. The potentially most useful CBMs and other steps pertaining to nuclear deterrence**

- Modernise the 1988 Agreement on the Prohibition of Attack against Nuclear Installations and Facilities
- Update the missile-testing prenotification regime to include cruise missiles
- Withdraw outdated, nuclear-capable short-range ballistic missiles from service
- Establish one or more nuclear risk-reduction centres
- Connect key nuclear establishments through an enhanced hotline system
- Conclude an agreement(s) on limited MIRV technology and BMD deployment
- Conclude an incidents-at-sea agreement
- Activate the agreement on strategic dialogue between government-affiliated think tanks
- Join the IAEA’s existing multilateral arrangement on fissile-material confidence building
- Establish cooperative border-management measures to interdict trafficking in nuclear materials
- Seek and reach negative security assurances at sea
- Start and sustain informal bilateral discussions on risk in national defence
- Start and sustain informal bilateral discussions on nuclear strategy including its lexicon
- Start and sustain a backchannel for crisis management, confidence building and resolution of outstanding issues
- Track 1.5 diplomacy involving senior security and other trusted officials in their private capacity

*Source: IISS*
New CBMs or official/semi-official dialogues pertaining to defence doctrines and related nuclear issues have their best chances of success when undergirded by political will or as part of a revived high-level political dialogue. Until then creative options are needed. Unilateral steps, coordinated between the two countries or not, may be possible. Envoys may have more success concentrating on avoiding accidents rather than on arms reduction or limitation, which are unpalatable to both countries. The administration of US President Joe Biden in Washington has generally committed ‘American nonproliferation leadership’ to ‘reducing the dangers posed by nuclear weapons’\(^1\). In its 2021 Integrated Review of Security, Defence, Development and Foreign Policy, the UK commits ‘to reducing tensions in South Asia, by encouraging regional dialogue on nuclear responsibilities, and by working with states there to understand and respond to safety and security threats to the region’\(^2\). Such approaches may encourage India and Pakistan (among others) to take creative steps of their own in this direction.

Ultimately, only India and Pakistan can find a solution to avoid the imprudent or mistaken use of nuclear weapons in their next crisis: they should consider reviving an uninterrupted backchannel. Beyond their own experience in the early 2000s, India and Pakistan could draw inspiration from the contact mechanism established by Robert Kennedy and Georgi Bolshakov in 1961, however imperfect it may have ultimately been. A backchannel that is not affected or interrupted by incidents in the relationship requires trusted envoys speaking with the authority of a mandate conferred by their national leader. Only such a mechanism can accommodate flexibly the mix of statesmanship, unilateralism, incrementalism, coordination, implicit reciprocity, discretion and deniability required to narrow differences; reduce the dangerous role of chance in crisis management; and build confidence as a prelude to hoped-for trust. In February–March 2021, reports emerged of efforts in this direction\(^3\) backed by the countries’ leaderships,\(^4\) marking a significant change from, possibly even a reappraisal of recent years. If those include a backchannel, as some reports indicate,\(^5\) they could help bypass each side’s official sensitivities and enable them to preserve face, while acknowledging three principal points:

- the centrality and legitimacy of India and Pakistan’s mutual ability to deter each other with nuclear weapons;
- the need to do so recognising that nuclear weapons are instruments of last resort, the use of which can only be contemplated in extreme circumstances where the survival of the state is in danger; and
- the desirability of mutual nuclear vulnerability as a factor in strategic stability.


Annex 1: Pakistan’s nuclear forces

Summary
Pakistan’s nuclear-weapons capability consists of land-based and air-delivered weapons. Along with land-based medium- and short-range ballistic missiles, Pakistan also operates the Babur ground-launched cruise missile, while the Ra’ad air-launched cruise missile has likely entered the air-force inventory. Islamabad also appears to be pursuing a submarine-launched nuclear-armed cruise-missile capability; test launches of a submarine-launched variant of the Babur cruise missile continued in 2018. The National Command Authority (NCA), led by the prime minister, is responsible for the operational control of the country’s nuclear-weapons inventory, with the Strategic Plans Division (SPD) managing the deployed systems and the associated security requirements. The director-general of the SPD is always an army officer.

Equipment
Pakistan’s land strategic forces are estimated to include more than 60 surface-to-surface launchers for nuclear-capable missiles. Around 30 are used for the short-range ballistic missiles Ghaznavi (Hatf-3) and Shaheen-1 (Hatf-4). Another 30 are allocated to medium-range ballistic missiles; Ghauri-1 (Hatf-5), Ghauri-2 and Shaheen-2 (Hatf-6). An unknown number are also used for close-range ballistic designs Abdali (Hatf-2) and Nasr (Hatf-9) and for the Babur-1/1A (Hatf-7) ground-launched cruise missiles. Pakistan has at least two additional medium-range ballistic designs under development: the Shaheen-3 and Alabeel, the latter of which is said to have the capability to carry multiple warheads. The service status of the Shaheen-1A and Babur-1B is uncertain.

Of the Pakistan Air Force’s 44 F-16A/B MLU Fighting Falcon aircraft at least some are assumed to have the ability to deliver nuclear gravity bombs, while the Mirage III aircraft, of which the air force has an estimated 39 in inventory, have been used in the test-launches of the Ra’ad and Ra’ad-2 dual-capable cruise missiles, and may now have a limited operational capability with the former.

The Pakistan Navy continues development work on the submarine-launched Babur-3 cruise missile, which has been in test since 2017.

Forces
The Pakistan Army deploys its nuclear/dual-capable short- and medium-range ballistic missiles in Strategic Missile Groups (SMGs) under the control of the corps-level Army Strategic Forces Command (AFSC). Based on official reporting it seems that these groups are each responsible for specific missile types and are probably regiment or brigade sized. It is not clear from open-source material if the Babur cruise missiles, and shorter-range systems such as Abdali or Nasr, have a similar organisational structure.

In the air force, No. 9 Squadron, equipped with the F-16A/B MLU aircraft and based at PAF Base Mushaf, and No. 7 Squadron, equipped with the Mirage III and based at PAF Base Masroor, may both have some form of nuclear role, given their proximity to the Sargodha and Masroor weapons-storage complexes respectively.
Notes

Annex 2: India’s nuclear forces

Summary
India’s nuclear capabilities are principally land based, though submarine-launched systems are in development and some of India’s combat aircraft might be nuclear-roled. The principal operational capability resides in the Prithvi and Agni families of short- to intermediate-range land-based ballistic missiles, with intercontinental-range versions currently in test. In addition, some Indian Air Force assets (such as Mirage 2000H or Su-30MKI fighters) may be tasked with a nuclear role. A naval component is now entering service with the Arihant class of nuclear-powered ballistic-missile submarines. Command authority for India’s nuclear weapons rests with the Political Council of the Nuclear Command Authority, chaired by the prime minister, while operational control lies with Strategic Forces Command (SFC), a tri-service command established in 2003. The post of SFC commander-in-chief is held on a rotating basis by a three-star military officer from one of the three services, and manages and administers all nuclear forces through separate army, air-force and navy chains of command.

Equipment
India’s land strategic forces are estimated to include at least 54 surface-to-surface launchers for nuclear-capable missiles. Of these, 42 are believed to be road-mobile launchers assigned to short-range Agni-I (12) and Prithvi-II (30) missiles and a separate 12 are rail-mobile launchers for the medium-range Agni-II and intermediate-range Agni-III missiles. Several further intermediate- and intercontinental-range ballistic-missile designs (Agni-IV, Agni-V and Agni-VI) are in development, although none are believed to have entered service yet. In late 2020, the Indian government approved the Shaurya hypersonic missile for deployment.

The Indian Air Force is believed to have assigned a secondary nuclear role to a small number of its fighter squadrons, often estimated as between two and four. This would imply a total force of approximately 80 aircraft; some combination of the Mirage 2000s, Jaguar IS and Su-30MKI may have the ability to deliver nuclear-armed gravity bombs. There is speculation that either or both of the Su-30MKI or India’s newly inducted Rafale aircraft may be intended to have a dual-capable land-attack cruise-missile capability, but there has been no official confirmation of this plan (see also pp. 28 and 32).

The Indian Navy currently operates one nuclear-powered ballistic-missile submarine, INS Arihant, which is fitted with four launch tubes, each capable of carrying three K-15 short-range submarine-launched ballistic missiles (SLBMs). A second boat in the class, INS Arighat, is currently awaiting commissioning, and there are plans for a further two hulls to be built to a stretched design (S4) with eight launch tubes. A larger, longer-ranged SLBM design, the K-4, is also currently under development. In addition to these submarines, the navy also operates a single surface ship as a test bed for the Dhanush ship-launched ballistic missile (a navalised variant of the Prithvi missile family).

Forces
333 Missile Brigade is headquartered at Kamptee, Nagpur, probably with the Prithvi-II launchers, having been formed in the early 1990s to take the Prithvi-I missile into service. The formation of two new missile brigades was authorised in 2003. The location of 334 Missile Brigade’s headquarters is unclear from open-source material, but may be at Secunderabad in central India. It is likely that 334 Brigade controls the Agni-I
launchers. 335 Missile Brigade was formed by at least 2008 and appears to be headquartered at Secunderabad (Telangana) with control over the rail-mobile \textit{Agni}-II launchers.

Each brigade is believed to comprise a number of battalion-sized subordinate missile regiments, numbered in accordance with the brigade to which it belongs (e.g., 3341 Missile Regiment, 3351 Missile Regiment, 3352 Missile Regiment). It is possible, if not probable, that a number of these regiments are geographically dispersed from their respective brigade headquarters; 3341 Missile Regiment, for example, is reportedly based in Assam in Northeast India.

The unit assignment of the \textit{Agni}-III is unclear. Given past practice, it might be reasonable to expect that a new missile brigade was stood up to operate the new missile. However, there is no open-source reporting on the formation of a new brigade in the appropriate time frame. Given that it is a rail-mobile design, like the \textit{Agni}-II it may simply have been assigned to the 335 Missile Brigade as well.

Although media sources often refer to additional Missile Brigades/Groups (including 222, 332, 336, 444 and 555), there is no obvious official sourcing in the public domain to confirm their existence, and it may be that some or all of these designations represent plans that ultimately did not come to fruition.
Notes

## Annex 3: Status of India’s and Pakistan’s select missiles (conventional and nuclear)

<table>
<thead>
<tr>
<th>Designation</th>
<th>Type</th>
<th>Launch</th>
<th>Maximum range1 (km)</th>
<th>NASIC status (est. launcher number) (2020)2</th>
<th>Status (IISS 2021)</th>
<th>Nuclear warheads (2020)3</th>
<th>Latest test (2010–)</th>
<th>Official description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PAKISTAN</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shaheen-3*</td>
<td>Ballistic</td>
<td>Land</td>
<td>2,750</td>
<td>‘Not yet deployed’</td>
<td>In development</td>
<td>2021</td>
<td>Flight test</td>
<td></td>
</tr>
<tr>
<td>Ababeel*</td>
<td>Ballistic (MRV)</td>
<td>Land</td>
<td>2,200</td>
<td>‘Not yet deployed’</td>
<td>In development</td>
<td>2017</td>
<td>Flight test*</td>
<td></td>
</tr>
<tr>
<td>Hatf-6 Shaheen-2*</td>
<td>Ballistic</td>
<td>Land</td>
<td>2,000</td>
<td>In service (&lt;50L)</td>
<td>In service</td>
<td>18</td>
<td>2019</td>
<td>Training launch</td>
</tr>
<tr>
<td>Hatf-5 Ghauri*</td>
<td>Ballistic</td>
<td>Land</td>
<td>1,300</td>
<td>In service (&lt;50L)</td>
<td>In service</td>
<td>24</td>
<td>2015</td>
<td>Training launch</td>
</tr>
<tr>
<td>Hatf-4 Shaheen-1A*</td>
<td>Ballistic</td>
<td>Land</td>
<td>900</td>
<td>(Not in report)</td>
<td>Uncertain</td>
<td>2021</td>
<td>Flight test</td>
<td></td>
</tr>
<tr>
<td>Hatf-4 Shaheen-1*</td>
<td>Ballistic</td>
<td>Land</td>
<td>750</td>
<td>In service (&lt;50L)</td>
<td>In service</td>
<td>16^</td>
<td>2019</td>
<td>Training launch</td>
</tr>
<tr>
<td>Hatf-7 Babur-1B*</td>
<td>Cruise</td>
<td>Land</td>
<td>700</td>
<td>(Not in report)</td>
<td>Uncertain</td>
<td>2018</td>
<td>Test</td>
<td></td>
</tr>
<tr>
<td>Ra’ad-2*</td>
<td>Cruise Air</td>
<td>Land</td>
<td>600</td>
<td>(Not in report)</td>
<td>In development</td>
<td>2020</td>
<td>Flight test*</td>
<td></td>
</tr>
<tr>
<td>Babur-3*</td>
<td>Cruise Sea (sub-surface)</td>
<td>Land</td>
<td>450</td>
<td>(Not in report)</td>
<td>In development</td>
<td>2018</td>
<td>Test fire</td>
<td></td>
</tr>
<tr>
<td>Hatf-7 Babur-1A*</td>
<td>Cruise</td>
<td>Land</td>
<td>450</td>
<td>(Not in report)</td>
<td>In service</td>
<td>12^</td>
<td>2021</td>
<td>Training launch</td>
</tr>
<tr>
<td>Hatf-8 Ra’ad*</td>
<td>Cruise Air</td>
<td>Land</td>
<td>350</td>
<td>(Not in report)</td>
<td>In service</td>
<td>2016</td>
<td>Flight test</td>
<td></td>
</tr>
<tr>
<td>Hatf-3 Ghaznavi*</td>
<td>Ballistic</td>
<td>Land</td>
<td>300</td>
<td>In service (&lt;50L)</td>
<td>In service</td>
<td>16^</td>
<td>2021</td>
<td>Training launch</td>
</tr>
<tr>
<td>Hatf-2 Abdali*</td>
<td>Ballistic</td>
<td>Land</td>
<td>200</td>
<td>No status given</td>
<td>In service</td>
<td>10</td>
<td>2013</td>
<td>Test fire</td>
</tr>
<tr>
<td>Fatah-1*</td>
<td>Ballistic</td>
<td>Land</td>
<td>140</td>
<td>(Not in report)</td>
<td>In development</td>
<td>Conv.</td>
<td>2021</td>
<td>Test flight</td>
</tr>
<tr>
<td>Hatf-9 Nasr*</td>
<td>Ballistic</td>
<td>Land</td>
<td>70</td>
<td>No status given</td>
<td>In service</td>
<td>24</td>
<td>2019</td>
<td>Training exercise</td>
</tr>
<tr>
<td>Hatf-1*</td>
<td>Ballistic</td>
<td>Land</td>
<td>70</td>
<td>No status given</td>
<td>In service</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>INDIA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Agni-VII</td>
<td>Ballistic</td>
<td>Land</td>
<td>-</td>
<td>‘Design phase’</td>
<td>In development</td>
<td>Untested</td>
<td>-</td>
<td></td>
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<td>Agni-V*</td>
<td>Ballistic</td>
<td>Land</td>
<td>5,000</td>
<td>‘Not yet deployed’</td>
<td>In development</td>
<td>2018</td>
<td>Test fire</td>
<td></td>
</tr>
<tr>
<td>Agni-VIII*</td>
<td>Ballistic</td>
<td>Land</td>
<td>4,000</td>
<td>‘Not yet deployed’</td>
<td>In development</td>
<td>2018</td>
<td>User trial</td>
<td></td>
</tr>
<tr>
<td>K-4**</td>
<td>Ballistic (sea (sub-surface))</td>
<td>Land</td>
<td>3,500</td>
<td>‘Not yet deployed’ (4L)</td>
<td>In development</td>
<td>2020#</td>
<td>Test fire</td>
<td></td>
</tr>
<tr>
<td>Agni-III*</td>
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<td>Land</td>
<td>3,500</td>
<td>In service (&lt;10L)</td>
<td>In service</td>
<td>8</td>
<td>2017 (2019 F#)</td>
<td>User trial</td>
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<td>Agni-VIII*</td>
<td>Ballistic</td>
<td>Land</td>
<td>2,000</td>
<td>In service (&lt;10L)</td>
<td>In service</td>
<td>12</td>
<td>2019#</td>
<td>User trial</td>
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<td>Nirbhay*</td>
<td>Cruise</td>
<td>Land</td>
<td>1,000</td>
<td>(Not in report)</td>
<td>In development</td>
<td>2019</td>
<td>(2020 F#)</td>
<td>Development flight trial</td>
</tr>
<tr>
<td>Shaurya*</td>
<td>Ballistic (H)</td>
<td>Land</td>
<td>750</td>
<td>(Not in report)</td>
<td>In development</td>
<td>2020#</td>
<td>Test fire</td>
<td></td>
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<td>K-15**</td>
<td>Ballistic (sea (sub-surface))</td>
<td>Land</td>
<td>700</td>
<td>In service (12L)</td>
<td>In service</td>
<td>12</td>
<td>2018##</td>
<td>Test fire</td>
</tr>
<tr>
<td>Agni-I*</td>
<td>Ballistic</td>
<td>Land</td>
<td>700</td>
<td>In service (&lt;75L)</td>
<td>In service</td>
<td>20</td>
<td>2018</td>
<td>Test fire training</td>
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<tr>
<td>Prithvi-III Dhanush*</td>
<td>Ballistic</td>
<td>Sea (sub-surface)</td>
<td>400</td>
<td>In service (2L)</td>
<td>In service</td>
<td>4</td>
<td>2018##</td>
<td>Test fire training</td>
</tr>
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<td><strong>BrahMos</strong></td>
<td>Cruise</td>
<td>Land, air, sea (surface and sub-surface)</td>
<td>400</td>
<td>(Not in report)</td>
<td>In service: land, sea (surface)</td>
<td>Conv.</td>
<td>2020</td>
<td>Joint test launches/test fire (land/air/sea-surface)</td>
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<td>Prithvi-III*</td>
<td>Ballistic</td>
<td>Land</td>
<td>350</td>
<td>No status given</td>
<td>In service</td>
<td>30</td>
<td>2020##</td>
<td>Test fire</td>
</tr>
<tr>
<td>Prithvi-I**</td>
<td>Ballistic</td>
<td>Land</td>
<td>150</td>
<td>No status given</td>
<td>In service</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Prabhat/Prahaar*</td>
<td>Ballistic</td>
<td>Land</td>
<td>150</td>
<td>No status given</td>
<td>In development</td>
<td>Conv.</td>
<td>2018</td>
<td>Flight test</td>
</tr>
<tr>
<td>Pinaka Mark-2*</td>
<td>Artillery</td>
<td>Land</td>
<td>75</td>
<td>No status given</td>
<td>In development</td>
<td>Conv.</td>
<td>2019</td>
<td>Flight test</td>
</tr>
</tbody>
</table>

**Key**
- *First officially acknowledged test*
- # Official media acknowledgement only/no government statement
- ## Test reported in other media reports only
- Conv. Conventional warhead only
- H Hypersonic
- F Reportedly failed
- L Launcher number
- ^ Figure for missile family (Pakistan)

Note: On SSBN missiles: India’s K-15, though only reportedly (not officially) tested, is presumed in service on the Arihant after India declared completion of a deterrent patrol (November 2018). One test is officially reported for the 3,500-km-range K-4 in 2020. The 5,000-km-range K-5 is reported in early development.
Notes

1 Maximum figure-based known range based on official releases (see notes) or if underlined, the NASIC 2020 report: see National Air and Space Intelligence Center (NASIC) in collaboration with the Defense Intelligence Ballistic Missile Analysis Committee (DIBMAC), ‘Ballistic and Cruise Missile Threat’, 11 January 2021, https://www.nasic.af.mil/News/Article-Display/Article/2468163/nasic-dibmac-release-unclassified-missile-assessment/ and https://media.defense.gov/2021/Jan/11/2002563190/-1/-1/2020%20BALLISTIC%20AND%20CRUISE%20MISSILE%20THREAT_FINAL_2OCT_REDUCEDFILE.PDF. At times, sources use qualifiers indicating a possible extended range beyond the figure provided.

2 Figures are those for launchers when provided in NASIC 2020 report.

3 In addition to those figures, India and Pakistan are estimated to also have respectively at least 64 (48 + 16) and 40 (36 + 4) aircraft-dropped and other nuclear warheads. All figures for missile types/families estimates as provided and annotated by the following source: Shannon N. Kile and Hans M. Kristensen, ‘World Nuclear Forces’, in SIPRI Yearbook 2020 (Oxford: Oxford University Press, 2020), pp. 364, 372, https://www.sipri.org/sites/default/files/YB20%2010%20WNF.pdf.


## Annex 4: India–Pakistan confidence-building measures

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Date agreed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exchange of List of Prisoners Between India and Pakistan (including civil prisoners and fishermen)</td>
<td>A comprehensive list of nationals of each country lodged in the other’s jails is exchanged each year, on 1 January and 1 July.¹</td>
<td>21 May 2008</td>
</tr>
<tr>
<td>Agreement Between the Republic of India and the Islamic Republic of Pakistan on Reducing the Risk from Accidents Relating to Nuclear Weapons</td>
<td>Allows for immediate exchange of information between India and Pakistan if an accident occurs that relates to nuclear weapons.²</td>
<td>February 2007; extended in 2012 for five years; then in February 2017 to 2022</td>
</tr>
<tr>
<td>Agreement Between the Republic of India and the Islamic Republic of Pakistan on Pre-Notification of Flight Testing of Ballistic Missiles</td>
<td>Each country must notify the other 72 hours in advance of conducting any ballistic-missile flight tests. Test missiles must not be close to either of their borders or the Line of Control.³</td>
<td>October 2005; extended on 27 December 2011</td>
</tr>
<tr>
<td>MoU between Indian Coast Guard (ICG) and Pakistan Maritime Security Agency (PMSA)</td>
<td>Aims to promote cooperation between the ICG and PMSA through the exchange of information about maritime activities. Communication link established.⁴</td>
<td>October 2005; extended in February 2016</td>
</tr>
<tr>
<td>Lahore Declaration</td>
<td>Sets out India and Pakistan's commitment to resolving the issue of Jammu and Kashmir peacefully; strengthening dialogue processes; taking steps to reduce accidental or unauthorised use of nuclear weapons; developing CBMs; and advancing the goals of the South Asian Association for Regional Cooperation.⁵</td>
<td>2 February 1999</td>
</tr>
<tr>
<td>India–Pakistan Joint Declaration on the Complete Prohibition of Chemical Weapons</td>
<td>Both countries agree not to develop, produce, acquire or use chemical weapons.⁶</td>
<td>19 August 1992</td>
</tr>
<tr>
<td>Code of Conduct for the Treatment of Diplomatic/Consular Personnel in India and Pakistan</td>
<td>Ensures that the facilities, privileges and immunities guaranteed to diplomatic and consular agents under the Vienna Conventions on diplomatic and consular relations are upheld.⁷</td>
<td>19 August 1992</td>
</tr>
<tr>
<td>Agreement Between Pakistan and India on Prevention of Air Space Violations and for Permitting Over Flights and Landings by Military Aircraft</td>
<td>Both countries will take steps to ensure that further violations of each other's airspace do not occur.⁸</td>
<td>6 April 1991</td>
</tr>
<tr>
<td>Agreement on advance notice on military exercises, manoeuvres and troop movements</td>
<td>Each country must give the other advance notice on any exercises, manoeuvres and troop movements it undertakes to avoid a crisis situation through misunderstanding of the other country's intentions.⁹</td>
<td>6 April 1991</td>
</tr>
<tr>
<td>Agreement on the Prohibition of Attack against Nuclear Installations and Facilities Between India and Pakistan</td>
<td>Agreement that India and Pakistan exchange a list of their respective nuclear facilities on 1 January annually.¹⁰</td>
<td>December 1988</td>
</tr>
<tr>
<td>Agreement for the Establishment of a Joint Commission Between the Government of India and the Government of Pakistan</td>
<td>Promoting cooperation for mutual benefit in areas of economics, industry, education, culture, technology and tourism.¹¹</td>
<td>10 March 1983</td>
</tr>
</tbody>
</table>
Notes


