

Nuclear Stability and Escalation Control in South Asia: Structural Factors

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When India and Pakistan became overt nuclear weapon states in May 1998, officials as well as opinion leaders in both countries pressed a common theme on western interlocutors: Pakistan and India, they argued, knew all too well the dangers that nuclear weapons posed from witnessing the global superpower rivalry and the strategic arms race during the Cold War. Indians and Pakistanis knew that nuclear weapons were for deterrence of nuclear war rather than for waging it, and they would be responsible stewards of the awesome destructive power in their hands. They would avoid the worst pitfalls the superpowers stumbled into during the Cold War by charting a course of restraint from the outset. “Minimum deterrence” would be their nuclear watchword in South Asia -- India and Pakistan each acquiring just enough nuclear retaliatory capacity to make sure the other believed full-scale war was unthinkable. This would forestall arms race compulsions and the military overspending that exhausted the former Soviet Union. Indian and Pakistani leaders would sidestep the worst-case assessment traps of imputing “first strike” planning and capability to the opponent and thus short-circuit the tendency to inflate minor crises into major ones.

If this brave new world of nuclear minimalism and expected stability ever existed in South Asia, its half-life was hardly perceptible. By May 1999, India and Pakistan were embroiled in the Kargil mini-war under a nuclear shadow. Indian nuclear weapons did not deter covert Pakistani planning and launching of a military probe across the Line of Control (LoC) in Kashmir. Many onlookers concluded that nuclear weapons actually emboldened the Pakistani high command to assume unusual risks in conducting the Kargil operation.¹

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¹ To keep Kargil in perspective, it may be recalled that both sides in the pre-nuclear years had carried out intermittent intrusions across the LoC to test the other side’s resilience or gain minor terrain advantages. Moreover, in what arguably was a strategic maneuver within the Kashmir envelope, India occupied the Siachen Glacier in 1984 where the LoC was not demarcated on the ground nor delineated on maps, initiating a high-altitude, low-intensity war there that is ongoing after twenty years. Nevertheless, Pakistan’s regiment-scale, cross-LoC operation in the Kargil sector in 1999 was bound to be viewed as more than just another tit-for-tat probe to test the other side’s resilience or

Likewise, Pakistan's nuclear weapons did not deter India from responding to Kargil with a wider military mobilization that threatened an expanded war, until the crisis was defused by US involvement.² President Bill Clinton gave Pakistan's Prime Minister Nawaz Sharif and the Pakistani military command a face-saving opportunity to pull forces back behind the LoC.³ Neither did Pakistan's nuclear weapons deter Indian military mobilization and brinkmanship with Pakistan in Operation *Parakram* during the near-year-long confrontation of 2001-2002, in response to a terrorist attack on India's parliament in December 2001.⁴

In short, rather than discourage military crises in South Asia, nuclear weapons may have stimulated or accentuated them and certainly made their occurrence more dangerous. By any common sense understanding of military stability or security equilibrium, the introduction of nuclear weapons to this region was not stabilizing.⁵ The United States and coalition operations in the Global War on Terrorism added new cross-pressures to South Asia after September 2001 that may have aggravated the existing nuclear instability. Some of the national expressions of responsible nuclear stewardship and restraint dating back to 1998 in India and Pakistan looked strained, if not jaded, in 2003.⁶

achieve a marginal advantage along the LoC, not only by India but also by the international community after the demonstration of nuclear weapons on both sides in 1998.

² The threat of expanded war was referred to in local terminology as the option of "horizontal escalation."

³ For accounts of the US role, see Strobe Talbott, *Engaging India: Diplomacy, Democracy, and the Bomb* (Washington DC: The Brookings Institution, 2004), chps. 8-9; and Rodney W. Jones and Joseph McMillan, "The Kargil Crisis: Lessons Learned by the United States," in Peter Lavoy and Sumit Ganguly, eds., *Asymmetric Warfare in South Asia: The Causes and Consequences of the Kargil Conflict* (Monterey, CA: Naval Postgraduate School) (forthcoming).

⁴ India's full-scale military mobilization along the borders with Pakistan in Operation *Parakram* (meaning "valor") reportedly was poised both for a limited war across the Kashmir LoC and a major invasion of Pakistan, allowing policy makers to choose from a wide spectrum of options. See Lt. Gen. (retd.) V. K. Sood and Pravin Sawhney, *Operation Parakram: The War Unfinished* (New Delhi/Thousand Oaks/London: Sage Publications, 2003).

⁵ Indian and Pakistani efforts to manage their nuclear instability were visible even in the years before May 1998 when each side's nuclear weapons programs were denied, but their existence was presumed. These management efforts have become more explicit and varied since the overt demonstration of nuclear weapons. See the companion essays by Rahul Roy-Chaudhury, "Nuclear Doctrine, Declaratory Policy, and Escalation Control," and Feroz Hassan Khan, "Nuclear Signaling, Missiles, and Escalation Control in South Asia."

⁶ The resumption of Indo-Pakistan diplomatic ties and transportation links in the winter of 2003-2004, and joint commitments to a composite dialogue on bilateral issues and disputes on the margins of the Islamabad South Asian Association for Regional Cooperation (SAARC) summit in January 2004, could be the opening of a more hopeful, new chapter in relations between the two countries. But to the degree the core problems between India and Pakistan remain unresolved, or in the event frictions resume or are intensified once again, the nuclear instability problems examined here are likely to remain serious and will need to be addressed directly with appropriate remedies. See "Only Kashmir: Time is not on the negotiator's side," and "Putting it bluntly," *The Economist*, September 11-17, 2004, pp. 11, 38.

STRUCTURAL CHALLENGES TO NUCLEAR STABILITY

Nuclear stability challenges in South Asia are exceptionally formidable due not only to the intractability of the longstanding Indo-Pakistan rivalry but also because both countries are contiguous and nuclear reaction times are very short. This essay focuses on the structural factors in the Indo-Pakistan security relationship that make it very different from what experts became accustomed to in the global stand-off between the superpowers, especially towards the end of the Cold War. The structural factors in South Asia appear to be especially conducive to military instability, accentuation of crises, and potential nuclear escalation. At bottom, the structural factors add up to an acute imbalance of military power to Pakistan's disadvantage, a condition more likely to worsen than improve. The structural factors as measures of capability, size, or vulnerability are relational between adversaries. They include for either side its defense resources and capabilities, geography and strategic depth, characteristics of military systems and organization, and availability of external allies, as these relate to those of the opponent.⁷

The risks inherent in how these structural factors tend to operate in a competitive relationship need to be understood in order to have the best chance of promoting stable conditions that reduce the chances of nuclear escalation from lesser levels of conflict in the subcontinent. This means showing how structural factors tend to influence the evolution of warfare in plausible Indo-Pakistan conflict scenarios at different levels of conflict, measured in scale and intensity.

The analysis here discounts "bolt out of the blue" nuclear attack scenarios as implausible in the foreseeable future in South Asia -- for political as well as technical reasons. But there are three levels of conventional conflict that recent events make entirely plausible between India and Pakistan (whatever the relative probabilities for the outbreak of conflict in each category) that could sow the seeds of nuclear escalation: (1) all-out conventional war; (2) limited conventional war for circumscribed purposes; and (3) unconventional or low-intensity war, employing guerilla warfare and clandestine methods. Intensity and scale of operations can vary within each category, to be sure, but the point to return to is that the disadvantaged side at any level of conflict will be under pressure to submit, stand its ground, or find a way to escalate.

An escalatory response may be designed to achieve a stalemate, but just as likely would be an attempt to restore initiative and seize an advantage -- through

⁷ Each side's nuclear force characteristics, early warning capabilities, and nuclear command and control features also come into play as structural factors that may partially determine how a military crisis plays out and whether mutual nuclear deterrence enables the sides to avoid nuclear escalation or retaliation. The structural features of military capability -- offensive and defensive -- that increase incentives for preemptive attack or that give rise to "use them or lose them" nuclear force dilemmas are, by definition, conducive to nuclear instability and escalation. They can be critical determinants in a fast-paced crisis.

maneuver, by broadening the front, or by application of greater force. Thus an unconventional or low-intensity conflict may escalate to a limited conventional conflict, as did Kargil through India's response in 1999, and a war that opens as a circumscribed conventional operation may escalate to one that broadens into a major conventional war -- the potential manifested in India's *Parakram* mobilization in 2002, and in Pakistan's counter-mobilization.

Some South Asia watchers are inclined to dismiss the possibility of an all-out conventional war between India and Pakistan as a fictional scenario lifted uncritically from "worst case" Cold War analogies. This line of thought seems to assume that it is nearly inconceivable that Pakistan would, as a premeditated action, initiate a major conventional conflict, which may well be true. This line of thought also rules out India initiating such a conflict because India's democratic political establishment would not entertain an offensive war. The latter may or may not be true (the *Parakram* mobilization surely leaves room for skepticism) but in any case this reasoning is a *non sequitur*. The scenario of all-out conventional war must be taken seriously as the basis for both Indian and Pakistani military force size planning and acquisitions. That backdrop, therefore, is the one to start with in this analysis.

The all-out conventional war scenario better highlights the structural factors of nuclear instability, but they do not recede to insignificance at lower levels of conflict and would be easily animated by escalation from lower to higher levels of conventional conflict -- even if decision-makers believe they are not trespassing on the opponent's presumed nuclear deterrent-activating "red lines." But examining the lesser scenarios, especially those of pre-meditated "limited war" is also important not only because of the general escalatory potentials, but also because military planners who believe it necessary to attempt to deter the other side's freedom to initiate "limited war" with impunity are virtually bound to consider the acquisition and deployment of tactical nuclear weapons, among other options, to the existing arsenals.⁸

CONVENTIONAL MILITARY IMBALANCE

In terms of overall national resources and derivative military power, India and Pakistan are obviously far from evenly matched. India, with over a billion people and 1.27 million square miles of territory, is a large power, a giant compared to Pakistan. For the last decade, India's economy has been growing more rapidly than Pakistan's. For conventional defense, India enjoys a naturally extended strategic depth, covering most of the subcontinent. Pakistan is much smaller, but still has a population of over 150 million, roughly equal to Russia's, and a territory of over 310,000 square miles, nearly twice the size of California. For territorial defense purposes, the land border between India and Pakistan extends some 1,800 kilometers. Together with each country's long coastlines,

⁸ See the companion essay by Michael Krepon, Ziad Haider, and Charles Thornton, "Are Tactical Nuclear Weapons Needed in South Asia?"

these distances stretch both sides' conventional air, ground, and naval forces. Except for the Kashmir region, the terrain along the Indo-Pakistan border is flat and open to armored penetration.

Today, the conventional military balance between India and Pakistan is highly asymmetrical. It is imbalanced in India's favor against Pakistan, a conventional disparity that continues to widen. This is a pivotal structural factor in assessing conventional and nuclear military instability in South Asia. The implications of this gradual but cumulatively important change in conventional military capabilities for nuclear stability in South Asia are not fully recognized or thought through, and in some circles the facts are even resisted. In the west, this issue has been sidelined by the new preoccupations of the Global War on Terrorism and the coalition's hard slog in post-war Iraq. For Pakistan, as is often the case of a lesser power facing a larger one, national leaders are inclined as a matter of political prudence to emphasize their defense capabilities and their resolve rather than advertise their vulnerabilities. In India's case, not unlike the United States at certain junctures before the Soviet collapse, domestic political debate and competing opinion leaders often highlight and exaggerate defense shortcomings, masking the implications of emerging capabilities. A brief retrospective on the milestones of deterioration in the military balance in South Asia may be instructive.

Pakistan's Deteriorating Posture

In the late 1950s and 1960s, Pakistan was powerful enough militarily to imagine it could shake India's hold over Kashmir, as it tried to do, albeit unsuccessfully, in the 1965 war. But Pakistan never enjoyed an offensive military capacity to invade India deeply, or to press for anything like a strategic advantage, notwithstanding the bravado attributed to Pakistani soldiers in the past. Any former illusions about this in the Pakistani high command were discarded after Pakistan's military humiliation by India in the 1971 war. Even after 1971, however, Pakistan's defensive military capacity to block a sustained conventional assault by India was robust and substantial.⁹ But Pakistan's defensive capability has been challenged slowly but steadily, beginning with India's ambitious military modernization of the 1980s and 1990s. By the late 1990s, the Pakistan Army and Air Force could not longer be assured of their ability to force mobilized Indian ground forces to a standstill close to the borders, precluding a deep invasion and buying time to mobilize international pressures for a cease-fire. Pakistani leaders presumably hoped that nuclear weapons would compensate for Islamabad's widening conventional disadvantage.

⁹ Ironically, the loss of East Pakistan actually made West Pakistan, the country we know as Pakistan today, more defensible because the bulk of the military manpower and defense resource base was originally from the western portion, and remained essentially intact, especially after a peace agreement permitted the return of Pakistani prisoners of war detained in India after the conflict. Defending East Pakistan was never viable against a determined Indian assault.

Nuclear weapons brought the potential for catastrophic conflict in South Asia to the fore. Total war is now possible and that prospect will shadow and increase the urgency of containing lesser conflicts. Past military conflicts between India and Pakistan (over Kashmir and the secession of East Pakistan, now Bangladesh) were limited in scale and brief in duration. None exacted heavy attrition or involved intense urban bombardment, and none were pursued as a “fight to the finish.” Except for the 1971 surrender of Pakistani forces isolated in East Pakistan, none of the past conflicts imposed conditions similar to unconditional surrender, let alone direct occupation or subjugation. On each occasion, casualties and collateral damage were quite limited.

Given Pakistan’s continued nurturing of conventional ground forces whose primary mission is withstanding a strategic Indian assault, India still would find it difficult for economic and logistical reasons to pursue an all-out conventional war against Pakistan. It would not be a cakewalk. The economic costs to India of large-scale operations against Pakistan would be severe. But the size and growing lethality of India’s modernized conventional forces projects the impression that New Delhi could sustain a high-tempo and potentially decisive war against Pakistan. Islamabad’s apprehensions are compounded by India’s successful acceleration of economic growth rates and potential economic capacity to sustain a long war.

India’s Growing Offensive Capacity

India’s extensive military modernization in recent years has greatly improved its capability for modern, fast-paced conventional warfare along its land borders with Pakistan, and this has accentuated Pakistan’s vulnerabilities to the effects of a major conventional conflict.¹⁰ India has many suppliers of advanced conventional arms and military technologies and has enjoyed increasing momentum in indigenous defense research and development, and arms production. Subject to Pressler Amendment sanctions between 1990 and 2002, Pakistan has had far slimmer options and much less financial wherewithal to acquire advanced military goods from western sources and has become increasingly dependent on China for major weapons systems, which are cheaper but technologically inferior to those of Russia and the western powers. This has accentuated the disparity between India and Pakistan’s leading edge conventional military forces, whether air, ground or naval forces. This disparity is particularly severe in air power.

¹⁰ For earlier studies charting India’s conventional force modernization and the balance with Pakistan, see Rodney W. Jones, “Old Quarrels and New Realities: Security in Southern Asia after the Cold War,” *The Washington Quarterly* (Winter 1992), pp. 105-128; republished in Brad Roberts, ed., *Foreign Policy after the Cold War* (Cambridge, MA: MIT Press, 1992), pp. 109-132; and Rodney W. Jones, “Principal Purchasers and Recipient Regions -- South Asia,” in Andrew Pierre, ed., *Cascade of Arms: Managing Conventional Weapons Proliferation* (Washington DC: The Brookings Institution, World Peace Foundation, 1997), pp. 305-339.

Simple numerical ratios between armed forces personnel and major weapons systems in the Indian and Pakistani order of battle, while invariably at least 2:1 and usually more in India's favor historically, have not themselves changed sharply, except in the naval area where India's forces have expanded and Pakistan's forces have shrunk. What has changed sharply in India's favor are the ability to mobilize rapidly and the ratios of expected combat effectiveness embedded in less easily measured qualitative factors of armaments, organization, and resupply capabilities. The qualitative factors include the characteristics of major weapon systems, the proportions of vintage versus state-of-the-art systems, and their allocation towards offensive strike and defensive missions; the acquisition of high-intensity, offensive war-fighting capabilities that rely on high performance aircraft; the acquisition of mechanized units supported by advanced surveillance and communications, enabling rapid movement, situational awareness, and organizational connectivity; the ability to support war plans that genuinely exploit combined arms coordination; the quality of training of officers and rank and file; and the motivation and morale of personnel. Pakistan's military personnel have maintained a high level of motivation and morale, but the Indian military have made strides in this area too, as demonstrated at Kargil in 1999.

India has forged well ahead of Pakistan in a wide range of conventional military force upgrades.¹¹ In ground forces the combat capability improvements include: extensive mechanization and mobility, longer-range and heavier armored and artillery firepower, some degree of integrated air defense, mobile sensors, airborne surveillance, and wide-area communications. If employed effectively, these upgrades could enable Indian forces to conduct large-scale, armored, battlefield maneuvers, outflank static defenses, and project firepower and airborne units well behind the forward edge of the battlefield. In air forces, India has acquired leading edge, ground-attack aircraft with laser-guided bombs; high performance fighters with better sensors and fire control; and longer-range air-to-air munitions. India already has rudimentary airborne warning and surveillance aircraft, and will acquire at least three sophisticated Israeli Phalcon airborne early warning and control system (AWACS) aircraft over the next three or four years.¹² India's naval capabilities are also increasing in range and combat support as well as bombardment and anti-submarine warfare capabilities. In broader terms, India has been advancing further and faster than Pakistan along

¹¹ For numerical trend data in the Indo-Pakistan military balance, separately tracking vintage and modern military systems, see Rodney W. Jones, "Force Modernization Trends - India and Pakistan," in *Conventional Arms Modernization in Asia and the Pacific* (Honolulu: Asia-Pacific Center for Security Studies) (forthcoming). Illustrative graphs may be found at http://www.policyarchitects.org/pdf/ForceModern_IndiaPakistan2.pdf. Also see Rodney W. Jones, "Conventional Military Asymmetry and Regional Stability Among Emerging Nuclear States: India and Pakistan," *Fourth Nuclear Stability Roundtable: Conference on Strategic Stability and Global Change*, March 12-13, 2002, http://www.policyarchitects.org/pdf/NucStability_IndiaPakistan1.pdf.

¹² This naturally has stirred up considerable Pakistani military concern. See Air Commodore Tariq Mahmud Ashraf, "IAF induction of AEW&C² aircraft: A paradigm shift in South Asian Air Power Scenario," *Defence Journal* 76 (December 2003), pp. 31-37.

the path of developing combined arms war-fighting capabilities in which the air and ground forces, and special force units, pursue common strategic, tactical, and battlefield objectives rather than merely those that play to the specialties of a single military service. Integrating forces in this manner, when realized operationally, adds significant force multipliers to each facet of combat.

Pakistan, by comparison, has been able to sustain and even gradually improve a substantial array of mechanized ground forces and its internal military communications, but has not been able to modernize or enlarge its air force to keep pace with India. Pakistan's main remaining advantages in blocking Indian ground force penetration are its shorter lines of supply and internal communications, the dug-in fortifications along canals and rivers in the Punjab corridor, and the capacity to re-deploy armored units quickly. Pakistan's facility with redeployment of armored forces is primarily applicable to the Punjab, or northern Pakistan, and to a lesser extent in Kashmir.

Air Power Imbalance

The worst deterioration in Pakistan's ability to fend off a large conventional assault by India, as mentioned earlier, is in the increasing air power imbalance. Pakistan has never had (leaving nuclear weapons aside) more than a pinprick airborne bombing or ground-attack capability against Indian cities or military airfields, as illustrated by the ineffectual Pakistani bombing mission against airfields around Agra during the 1971 war -- the only long-range air strike Pakistan ever attempted. Still, in the 1970s, Pakistan's air force probably could have acquitted itself well enough to defend and maintain control over its own airspace and airfields. This capability could have ensured air cover to ground forces back then to withstand major assaults in Punjab and Sind, but Pakistan's capability for assuring air defense of its own territory has been eroding.

India's ongoing acquisition of high-performance ground-attack and fighter interceptor aircraft (e.g., Jaguar, Mirage-2000, Su-30K and Su-30MKI on the attack side, and upgraded Mig-23s and -29s on the interceptor side), along with laser-guided bombs, beyond visual range (BVR) air-to-air missiles, new air-to-air refueling capabilities (to increase sortie rates) and airborne surveillance platforms, means India has assembled a formidable capacity to attack and potentially disable Pakistan's airfields, and wrest control over Pakistan's airspace.¹³ The range of Indian aircraft and Pakistan's narrow strategic depth would enable India to attack most urban areas and airfields in Pakistan within a few minutes of crossing the border. The air distances and times of travel for high-performance aircraft to these targets in Pakistan are minimal. If India

¹³ India reportedly has an agreement with Russia to lease four or five Backfire bombers, a supersonic medium-range bomber with large payload capacity that could also reach Chinese cities, especially with air refueling and standoff attack capability. Against Pakistan, this system not only has obvious nuclear implications but also provides India with a platform to drop large payloads of conventional bombs on concentrated military targets.

achieved its objectives of striking Pakistan's airfields and caught a large number of aircraft on the ground, it would leave Pakistan's ground forces exposed to disruptive and potentially crippling air and ground attacks.¹⁴ This objective has been nurtured in Indian air force doctrine for over twenty years, but trends today make this objective increasingly credible.

In short, the growing asymmetry between Pakistani and Indian conventional capabilities from India's incremental but substantial conventional arms build up, and the related capabilities to pursue warfare at higher tempo, at longer range, and with focused firepower, technically means that India probably could -- albeit at high economic cost and heavy international disapprobrium -- conduct a conventional war against Pakistan designed to destroy its conventional military capacity and deprive it of political independence. Prosecution of such a war could, at some point, threaten the collapse of Pakistan's conventional defense capabilities. This in turn would push Pakistan, in order to avert national collapse and presumably as a last resort, to consider the deliberate use of nuclear weapons strategically against India. The increasingly lopsided conventional military balance is the core structural basis of nuclear instability between India and Pakistan today.

Effects of the War on Terrorism

Military instability resulting from the contention over Kashmir has been accentuated by the Global War on Terrorism. Muslim extremists from the Kashmir insurgency can launch terrorist strikes in India's heartland provoking India to engage in punitive retaliation against Pakistan, as India threatened by its mobilization after the December 2001 terrorist attack on India's parliament. The structural aspects of military instability are thus acutely sensitive to terrorist activity. The Bush doctrine of preemption that targets not only terrorists but also the states that harbor them gives India opportune political cover for military action against Pakistan when Muslim terrorists hurt India. Punitive Indian military actions against Pakistan, even if limited in scope, are virtually certain to produce a commensurate military riposte and thus have the potential to expand horizontally into a wider conventional conflict, climbing an escalation ladder whose final rungs imply the use of nuclear weapons.

Shifting External Alliance Relationships

The Indo-Pakistan military balance today has also been altered by shifts in alliance relationships. India's traditional calculation of Pakistan's military weight took Pakistan's Cold War security relationship with the United States into account, as well as Pakistan's friendship with China that began in the

¹⁴ India also has a growing airborne transport capacity to put troops and light equipment on the ground behind interior lines where air superiority may have been established. See Air Commodore Tariq Mahmud Ashraf, "Air Power imbalance and Strategic Instability in South Asia," prepared for conference on Strategic Stability in South Asia, Naval Postgraduate School, Monterey, CA, June 30-July 1, 2004.

1960s. Similarly, Pakistan weighed India's friendship with the Soviet Union and Soviet military assistance in its threat perception. After a hiatus the former Soviet arms transfer relationship with India was revived by Russian arms sales in the mid-1990s. The once close US relationship with Pakistan waned, reaching a low ebb in the 1990s due to friction over Pakistan's nuclear weapons and ballistic missile development programs.

US-Pakistan military cooperation was revived after 2001, in the context of the Global War on Terrorism, but the scope of this cooperation is conditioned by the development of a much closer US-India security relationship than ever before. US interest in India's security concerns builds on India's own support for the Global War on Terrorism as well as on India's regional power potential. In this light, the prospects of India acquiring advanced military equipment from the United States are greater than for Pakistan. Moreover, while China remains a steadfast friend and arms supplier to Pakistan, China and India have evolved a more constructive bilateral relationship that accentuates trade benefits and negotiations on border disputes, downplaying former grounds for hostility. Meanwhile, China's support for Pakistan's claims to Kashmir has abated. The net effect of these political shifts on the Indo-Pakistan military balance is more advantageous to India than Pakistan, and thus reinforces the trends toward greater conventional imbalance described earlier. The United States seeks to balance its interests in the region, recognizing that Pakistani cooperation in pursuing the Global War on Terrorism is vital. Thus, US efforts in the region demand constructive relations with Pakistan as well as India. Nevertheless, longer-range trends are likely to deepen US-Indian cooperation more than US cooperation with Pakistan.

CONVENTIONAL CONFLICT SCENARIOS

As long as the Indo-Pakistan relationship remains hostile and driven by mutual insecurity, war may reoccur. The growing salience of terrorism and the potential for a catalytic act of terrorism almost certainly have increased the near-term chances of war. Three levels of conflict already mentioned -- unconventional, limited conventional, and major conventional -- each carry potentials for escalation from one level of conflict to another, and ultimately to the grim prospect of nuclear exchange. A major conventional war launched by India as a strategic venture to destroy Pakistan's military capacity and presumably subordinate Pakistan permanently remains the key contingency for both side's military requirements and force planning. India's Brasstacks exercise of 1986-87 and its *Parakram* mobilization of 2001-2002 both assembled forces that could have been employed from a standing start to support such a major conventional war effort.

Since India eventually withdrew many of the forces assembled by *Parakram* to peacetime locations, standing down from the confrontation, it has become fashionable for observers to believe that India had decided from the beginning not to launch a major war but rather endeavored to project a credible

threat that could, coupled with anticipated US pressure on Islamabad, compel Pakistan's military leadership to stop the infiltration of Pakistani extremists into Kashmir. It is easier to argue that case in retrospect, particularly since India and Pakistan have returned to negotiations since January 2004. At the time, Indian decision makers probably were not certain of the course of action they would settle on, and there is no doubt that punitive military actions which could have triggered a major war were seriously contemplated.¹⁵ Moreover, another highly visible terrorist attack in New Delhi like that against parliament in December 2001 could have ignited sufficient anger to induce Indian leaders to unleash the forward-based forces assembled in *Parakram*.

The assiduous development in India's domestic military discourse of "limited war" thinking since the Kargil war, and the very recent surfacing this year of "cold start" concepts -- essentially a proactive and punitive use of rapid-action conventional forces for limited objectives, sidestepping a major conventional war and thus stopping well short of Pakistan's presumed nuclear "red lines" -- requires assessment of limited conventional war scenarios and their nuclear escalatory implications. Arguably, the probability of conflict beginning at this level in the foreseeable future is considerably higher than a premeditated launch of a major conventional war. Tracing the relationships between the structural factors in the Indo-Pakistan security environment and those in cold start or limited war initiatives, to the extent that escalation may be avoided, is more challenging. By limiting objectives and scale of attack, India would stop short of pushing Pakistan to the wall, which means not exploiting Pakistan's structural disadvantages fully. But certainly, the structural issues will return to the fore if limited war initiatives by the attacking side provoke innovative responses by the defender, prompting subsequent operations by both sides that spiral into major conventional operations.

Major Conventional War Scenario

Despite its overall size, Pakistan is strategically vulnerable to a fully mobilized Indian conventional invasion mounted simultaneously in separate corridors along Pakistan's north-south axis, and also vulnerable to naval action that could embargo traffic into and out of Pakistan's ports. Pakistan's geographically confined trunk lines of communication between the main international port of Karachi in Sind province to the south and the Punjab

¹⁵ Sood and Sawhney's account has New Delhi coming very close to initiating a limited war across the LoC in Kashmir in the first week of January 2002, and then again in June 2002, with a military offensive both in Kashmir and with armored strike corps in the Thar Desert. (*Operation Parakram*, op. cit., pp. 59-63) They note, "Vajpayee publicly regretted not going to war with Pakistan after December 13 [2001, after the attack on parliament], admitting that it was a mistake [not to do so]." (Ibid., p. 60) "In hindsight," they conclude, "three observations could be made about India's plans in June. First, the army did not believe in the concept of a limited conventional war [but rather in a major conventional war]. Two, the army believed that Pakistan would not use its nukes early in a war. Most importantly, it appears that the Indian political leadership was deterred by Pakistan's nukes more than Pakistan was by India's putative nuclear second-strike capability." (Ibid., pp. 82-83)

heartland in the north could be severed by a large-scale, air-supported, armored incursion. The vulnerability is further accentuated by the proximity to India of Pakistan's key urban centers in Punjab, particularly Lahore -- which is hardly thirty miles from the border opposite Amritsar, and potentially subject to long-range artillery bombardment from Indian soil. This sector of central Punjab has been the favored avenue for India's past armored incursions into Pakistan. While border areas are fortified on both sides, taking advantage of the main rivers and many feeder canals in that sector, the distances to vital centers in Pakistan's interior are short, and obstacles can be surmounted by combined arms operations.

From India's border in Rajasthan to Pakistan's trunk lines of communication at the junction of southern Punjab and Sind is a mere fifty to sixty miles of essentially flat, desert terrain. Traversing this distance with armored columns given close air support, Indian forces could sever Pakistan's north-south trunk railway and road links between Rahim Yar Khan and Sukkur. Unresisted and with the offensive force well prepared, such an operation on the desert flats could be carried out in two or three days. With expected fierce resistance, it is still possible that Indian forces could break through and squeeze Pakistan's jugular within two or three weeks. Such operations have been part of Indian military force planning, doctrine, and exercises since the tenure of General K. Sundarji, Indian Chief of Army Staff, in the mid-1980s.

The strategically disabling major conventional war scenario of cutting Pakistan in two could be amplified by an Indian naval blockade of Karachi and Gwadar, stopping imports of petroleum, oil, and lubricants (POL) as well as other seaborne strategic goods.¹⁶ Such action was hinted at by Indian naval

¹⁶ Pakistan's vulnerability of having a single international shipping port at Karachi, and all its combat ships potentially "bottled-up" at adjacent Qasim Naval Base, has long been a concern for Pakistan. Plans have been explored over the years for the development of new international-class port facilities at Gwadar (little more than a fishing village) and for additional naval facilities, northwest of Karachi on the 700-kilometer Makran coast in Baluchistan province, which borders Iran. Implementing these objectives was hampered by the large capital costs for enlisting foreign construction companies not only to create and dredge new shipping facilities and channels along the desert terrain of the Baluchistan coast, but also the additional cost of building urban infrastructure, e.g., power and fresh water facilities, jet-handling airfields, and solid highways across the arid terrain, to interconnect these coastal areas with roads on a northward axis directly to the interior as well as with Karachi to the southeast. Engaging western contractors and financing was also set back by the Pakistani nuclear testing in the Chagai Hills of Baluchistan in 1998. In the late 1990s, however, implementation moved forward on a 1992 plan to build a second naval facility, the Jinnah Naval Base, capable of handling submarines and surface ships, 240 kilometers from Karachi at Ormara. Construction was in the hands of the Turkish firm, STFA. General Pervez Musharraf inaugurated the Jinnah Naval Base in June 2000, after the first phase of construction and channel dredging had been completed. Report from Pakistan Television (PTV) National News Bureau, June 22, 2000, available at <http://www.globalsecurity.org/wmd/library/news/pakistan/2000/000622-pak-ptv1.html>. In a May 2001 visit to Pakistan, Zhu Rongji, then China's Prime Minister, pledged \$240 million in assistance to the 1992 plan to build a deep-water port at Gwadar, and an additional \$200 million to build a 650 kilometer coastal highway linking Karachi and Gwadar, apparently in return for certain Pakistani commitments related to Chinese mineral extraction concessions in Baluchistan. A former Indian intelligence analyst has written that China was lured to make these pledges by

preparation and movements in the Kargil limited war in the summer of 1999, and on a larger scale during the full military mobilization of 2001-2002.

If a major conventional war scenario unfolded along these lines, intense international pressure would be exerted on India to stand down its invasion and withdraw forces behind the international border. This expectation of intervening pressure from abroad is one of Pakistan's expected lifelines, although not regarded as a substitute for attending to its own means of defense. International pressures might well prevail, but they might also fail.¹⁷ If India were to brush aside international pressure and continue, or step up, its conventional combat efforts and try to pursue them to a quick conclusion -- which could imply Pakistani loss of territory, a Pakistani military defeat, or Pakistani political submission -- the Pakistani leadership almost certainly would deploy combat-ready nuclear forces and seriously consider how to employ their nuclear options.

A nuclear "bolt out of the blue" scenario of the sort imagined by US and Soviet planners at the apex of the Cold War seems highly improbable in a South Asia context. Such a scenario also seems unlikely between China and India. Several Cold War political and technical conditions that affected superpower confrontational dynamics are missing in Asia. No relentless ideological rivalry exists in Asia today and, unlike divided Europe after World War II, China and the two South Asian powers do not exercise extended deterrence over other states in far-reaching alliance systems. All three Asian states lack the intelligence assets and large inventories of highly accurate, long-range, nuclear-strike systems that posed a strategic surprise attack threat during the Cold War. If reports are to be believed, India and Pakistan have not, so far, deployed nuclear strike systems in prompt response modes. This last condition, however, is subject to change with time.

Almost all plausible scenarios in South Asia for the deliberate initiation of planned strategic nuclear strikes would arise after the outbreak of conventional war, and generally would become realistic only when one side is winning and the other side appears to be losing badly. The deployment and readiness to use tactical or air-delivered nuclear weapons to offset or preempt major

Pakistani promises to grant China concessions to build a naval signals monitoring facility on the Makran coast (opposite the Strait of Hormuz on the Arabian Sea), and assurances for berthing facilities for its naval vessels at Ormara as well as Gwadar. See B. Raman, "Chinese Activities in Balochistan," South Asia Analysis Group, paper no. 259, June 18, 2001, available at <http://www.saag.org/papers3/paper259.html>.

¹⁷ The brevity of past Indo-Pakistan conflicts has been dictated, in part, by both sides having insufficient wartime consumables (e.g., ammunition and equipment spare parts) for a sustained war. Both have also faced shortages or logistical bottlenecks in the supply of POL to active forces. It is quite likely that these would remain serious constraints on India's capacity to pursue an intense conventional war for more than a few weeks. International reactions could also ensure that these constraints would be felt earlier rather than later. While these constraints can be anticipated, there is no guarantee that New Delhi's calculating them in advance would prevent the launch of a major conventional war or that a sorely provoked India would be halted by their effects within a few weeks of the onset of war.

conventional setbacks would complicate the picture considerably, making it possible for nuclear crises to arise very early after a conventional conflict has begun. Were Pakistan to announce that it was deploying tactical nuclear weapons and did so among selected armored or infantry units, for example, a nuclear crisis would be in full swing. Any notional Indian calculations of where Pakistan's red lines might be crossed by Indian operations in a limited conventional war, or a cold start type of operation, could become more mobile and blurred.¹⁸ If Pakistan's actions did not cause India to pause in its conventional offensive operations, and if India similarly were to declare and deploy tactical nuclear weapons, and show signs of bringing nuclear weapons to a high state of readiness, Pakistan's options in response would be stark: either to attempt to force the conventional action to a stalemate by conventional means (aided by international support if it is available), to fire a nuclear weapon in an uninhabited area as a warning shot, or devise a tactical nuclear attack against Indian conventional military forces to break their momentum. Once any nuclear strike is carried out, the odds of escalation probably far outweigh chances of halting that conflict without further nuclear attacks.

Nuclear crises not triggered by the onset of conventional warfare (with or without the tactical nuclear weapons deployed in the order of battle) are conceivable in South Asia from at least three other sources. One is a general military crisis in which forces have been mobilized for rapid action and one side mistakenly believes that the other is preparing for strategic nuclear strikes early in an impending conflict. Another is the possibility that a terrorist attack would inflict large-scale destruction on an urban locality on one side, after stealing or covertly assembling and successfully detonating a nuclear weapon. A third, although perhaps the least likely to trigger an immediate nuclear retaliatory response, would be an act of sabotage at a nuclear installation that disperses nuclear materials, or a terrorist incident that disperses radioactivity by detonating chemical explosives enclosing a radiation source.¹⁹

The second and third scenarios of high-profile terrorist or saboteur action clearly would generate much more intense pressure on decision makers if they were to occur when the opposing armed forces are already mobilized and ready for conventional war, or have actually begun hostilities. The pressure exerted would be even greater if tactical nuclear weapons were deployed or if there were

¹⁸ Lt. Gen. Khalid Kidwai, chief of Pakistan's Strategic Plans Division in the nuclear command and control hierarchy, outlined criteria describing in general terms thresholds at which Indian conventional aggression could force Pakistan to consider a nuclear response. See the report by Italian visitors of their interviews with Pakistani officials and experts: Paolo Cotta-Ramusino and Maurizio Martellini, *Nuclear Safety, Nuclear Stability and Nuclear Strategy in Pakistan* (Como: Landau Network, January 2002). For an assessment of Kidwai's points, see Rodney W. Jones, "South Asia Under the Nuclear Shadow: Is Stable Nuclear Deterrence Feasible?" *The Friday Times* (Lahore), February 22-28, 2002, available at <http://www.policyarchitects.org/pdf/stablenucleardeterrence.pdf>.

¹⁹ See Kishore Kuchibhotla and Matthew McKinzie, "Nuclear Terrorism and Nuclear Accidents in South Asia," in Michael Krepon and Ziad Haider, eds., *Reducing Nuclear Dangers in South Asia* (Washington DC: The Henry L. Stimson Center, January 2004).

signs that strategic nuclear weapons were being readied for use. There would be a temptation to assume that terrorist or sabotage acts were covert extensions of the other side's military campaign, even though the terrorist or saboteur operation could be quite independent in origin.

While a nuclear "bolt out of the blue" between India and Pakistan is highly unlikely, once a major conventional conflict is under way, the side that believes itself most likely to lose could decide to prepare itself to carry out a pre-planned strategic nuclear strike as retaliation for the heavy toll it would have absorbed. In response to the inception of a full-scale conventional war begun by its opponent, in order to try to get the opponent to scale down its offensive or even to stand down, it could threaten its adversary's survival. This is the position that Pakistani military planners apparently believe they must be prepared for as a possible outcome of a full-scale war launched by India.

Moreover, in this scenario -- with conventional warfare already underway and Pakistan's defenses coming under acute strain -- it is conceivable that both Indian and Pakistani military planners would feel compelled to take precautions against the other side escalating to the nuclear level. Pakistan would fear an Indian conventional preemptive campaign to destroy its nuclear assets before they could be used.²⁰ India, similarly, would worry about Pakistani leaders contemplating a nuclear decapitation attack.²¹ A decapitation scenario would mean attacking the other side's national capital and targeting its leadership nodes with nuclear weapons to shut down its central decision-making system, either to halt its offensive campaign abruptly, or failing that, to preempt coherent nuclear retaliation, or limit its scale and effectiveness. If either side becomes convinced that its opponent is preparing a nuclear decapitation attack, however

²⁰ The threat of Indian airborne conventional preemption of Pakistan's nuclear assets first surfaced in the 1980s as an attack on the uranium enrichment facility at Kahuta and has been an underlying theme in press and think tank commentary. President Musharraf's September 18, 2001 address to the nation touched on this Indian threat as justification for Pakistan's decision to join the US-led Global War on Terrorism without delay. See *Dawn*, "Highlights of President Musharraf's Address to the Nation," on-line edition, Sept. 19, 2001. Of the several reasons he set forth, the most graphic was India's unprecedented offer of the use of its air bases for US and coalition operations against the Taliban regime in Afghanistan. This would have meant foreign military overflights of Pakistan's territory to Afghanistan, but could also have masked Indian surprise air attacks on northern Pakistan. Allowing US use of Pakistani air bases closer to Afghanistan obviated the Indian offer.

²¹ A senior Indian journalist, Raj Chengappa, who interviewed insiders after the 1998 nuclear tests on their recollections of milestones in India's development of nuclear weapons and delivery systems, reports that prime minister Rajiv Gandhi took the first steps to protect India's national leadership against a nuclear decapitation attack from Pakistan. Chengappa writes, "After Rajiv's orders in 1986, [defense R&D chief] Arunachalam launched a cautious drive to enhance India's state of nuclear preparedness. ... [Rajiv] wanted a command and control centre setup which could not only withstand a nuclear attack but have sophisticated communications systems from which the prime minister could direct the country's armed forces during a war. Arun Singh [then minister of state for defense] was told to set up a national command post at a secure location near the capital." See Chengappa, *Weapons of Peace: The Secret Story of India's Quest to be a Nuclear Power* (New Delhi: Harper Collins Publishers India, 2000), p. 304.

remote that contingency might seem prior to hostilities, that side might feel compelled to strike first.

Given air power trends, a future Indian preemptive or disarming strike need not necessarily be nuclear. A conventional disarming strike against those Pakistani strategic nuclear assets that may be stored in fixed sites -- based on initial surprise, and then on an extended air campaign -- is at least theoretically conceivable. Such a campaign probably could not quickly find and target mobile nuclear missiles that had already been dispersed in the field or even camouflaged nuclear-capable aircraft at dispersed airstrips. But such a campaign might be aimed at destroying strategic nuclear weapon components in storage sites -- if all those sites are known or can be identified early in the course of operations. The objective would be to prevent nuclear weapon assembly and mating with strategic delivery systems. Indian conventional air strikes against air bases and other high-value military facilities in Pakistan are part of routine Indian military planning and could be unleashed as punitive measures to a severe provocation, as a prelude to a punitive invasion on the ground, or as further retaliation for a Pakistani conventional response to an Indian punitive attack. Pakistan's efforts in recent years to augment its anti-aircraft defenses could make a difference, but it is not clear they could blunt a determined offensive air campaign. Air defense systems would also be early targets for suppression in an air campaign.

This scenario not only is theoretically conceivable but also conforms to India's military air mission objectives in a full-scale conventional war with Pakistan. How successful India would be in attacking airfields and crippling Pakistan's aircraft inventory, or in destroying nuclear weapons or missile delivery systems in storage, faces a number of imponderables. Pakistan's nuclear storage facilities presumably are below ground and well camouflaged; and they probably are concentrated in northern Punjab, amidst ground forces that could be mobilized quickly to counter commando raids. In addition, Indian intelligence means might be successful over time in identifying critical sites that have distinctive signatures associated with nuclear weapons. For Pakistan to be sure it can defeat this Indian objective, it presumably has emergency dispersal procedures for dedicated aircraft and missile delivery systems, and may be prepared, even under attack, to keep moving nuclear weapon assets and delivery systems out of harm's way. But movement of these systems under such duress could shorten their fuse.

If these Pakistani aircraft and mobile missile system dispersal and concealment efforts were only partially successful and significant attrition of those strategic assets occurred, the Pakistani leadership would almost certainly consider threatening to use surviving strategic assets for retaliation, before all were lost. If India contemplates conventional preemptive attacks on air bases and other ground-based military facilities, one may surmise that Pakistani strategic nuclear assets are likely to come under attack as well. It then follows

that Indian conventional posture and doctrine are intrinsically destabilizing. For its part, Pakistan would not have the conventional bombing reach to present a similar threat, either to interior Indian air bases or to sensitive Indian strategic facilities -- unless, in the course of a crisis, some of the latter are located near the borders.

Limited Conventional War Scenarios

The chances of nuclear escalation arising out of a limited conventional conflict clearly would be much less than from a major or all-out conventional conflict. Much would depend on whether a limited conventional conflict escalates in steps toward a major one, due to either side seeking to redress setbacks suffered from the other's offensive, with iterative expansion of the war. The process of escalation of conventional conflicts from one level to another is the issue of immediate concern here.

Not surprisingly, most of the contemporary public discussion of limited conventional war as a viable offensive option surfaces in India. Pakistan does not have a large menu of plausible options for limited offensive military actions against India. Pakistan certainly could organize and employ limited conventional thrusts that would have a chance of inflicting damage, occupying salients across the Punjab border, and tying down some opposing forces, but not without risk of impairing its main blocking capacity against a major Indian invasion. If India conducted limited operations with the advantage of surprise and suffered few losses, Pakistan would likely respond, at least in proportion to the provocation, and would attempt to exploit gaps in Indian defenses at points of Pakistani choice. More likely than not, this would be seen by India as escalatory, and perhaps begin a chain of actions and reactions.

Indian military thinking has been evolving since Kargil toward concepts of limited conventional military action against Pakistan that proponents believe would not cross Pakistan's nuclear red lines, and therefore would discount Pakistan's nuclear deterrence. The US shift after September 11 to explicit policies of military preemption against international terrorism provides natural cover for this new Indian military thinking.

The principal focus of limited war options when they first surfaced in Indian debate in 1999 was along the LoC regions of Kashmir, with the effects of the Kargil mini-war fresh in mind. The main thrust was on the feasibility of using limited military strikes to interdict infiltrators from Pakistan, and to attempt to destroy or shut down so-called "terrorist training camps" believed to be located around Muzaffarabad in the western and most heavily populated part of Pakistan-held (Azad) Kashmir, adjoining Punjab province. The operational concept for such strikes apparently involved combined fighter aircraft ground-attack sorties and helicopter-borne special force operations intruding across the

LoC without warning.²² These strikes might be accompanied by artillery barrages immediately across the LoC, ostensibly attacking infiltration routes but also tying down opposition infantry forces locally. In the aftermath of such strikes, India naturally would draw attention to US precedents before and after September 11 in using cruise missile strikes against al Qaeda and Taliban training camps in the mountains of Afghanistan.²³

Doubts that such strikes would be effective against infiltrators or disruptive of training activities must have affected calculations on the Indian side. The primary objective of such strikes would have been political -- to draw world attention in a graphic way to the problem as India sees it of terrorist infiltration into India, and to ramp up leverage on Pakistan to clamp down on *jihadi* organizations. Precisely because the effects would be more political than military, proponents might argue that Pakistan could afford to absorb such strikes without a direct military response. But the odds are that Pakistan would retaliate with some form of artillery and air strikes at least on Indian military posts near the LoC, and perhaps with fighter aircraft sorties against Indian security force staging areas deeper in Kashmir, to satisfy its own public that it has means and the will to retaliate against India.

After September 11, and particularly after December 13, 2001, when India ramped up Operation *Parakram*, the concept of Indian surprise air attacks on training camps in Azad Kashmir assumed a far higher sensitivity. Surprise air attacks on localities near Muzaffarabad (using mountainous terrain to conceal the approach) would bring Indian aircraft or helicopters only minutes away from such sensitive defense-related facilities in Pakistan as the Kahuta uranium enrichment plant, and co-located or nearby nuclear storage facilities, not to speak of the constellation of Pakistani military infrastructure nearby in Rawalpindi and satellite areas. There was palpable concern in Islamabad at that time -- partly because of sensational articles in the western media speculating about foreign intervention to lock down Pakistani nuclear assets thought to be in danger of diversion to terrorist entities -- that Indian attacks directed ostensibly against terrorist targets might provide cover for expanded strategic attacks on Pakistan's nuclear assets.²⁴ Pakistan would have had to confront the question whether air retaliation against Indian military positions in Kashmir would have invited Indian escalation against strategic targets.

²² Sood and Sawhney, *Operation Parakram*, op. cit.

²³ "Clinton Defends Military Strikes," *BBC News*, August 20, 1998, available at <http://news.bbc.co.uk/1/hi/world/africa/155252.stm>; "U.S. missiles pound targets in Afghanistan, Sudan: Retaliation for bombing of U.S. embassies in Eastern Africa," *CNN.COM*, August 20, 1998, available at <http://www.cnn.com/US/9808/20/us.strikes.01/>; Andrew Koch, "Air and missile strikes herald new phase in the fight against terrorism," *Jane's Defence Weekly*, October 7, 2001, available at http://www.janes.com/security/international_security/news/jdw/jdw011007_1_n.shtml.

²⁴ Seymour Hersh, "Watching the Warheads: The Risks to Pakistan's Nuclear Arsenal" *The New Yorker*, October 29, 2001.

India stood down Operation *Parakram* in the fall of 2002 without consummating any combat military operation against Pakistan. While Pakistanis and most westerners breathed a sigh of relief, the military discourse in India continued. Critics of India's withdrawal without launching even limited strikes opened up a new line of thinking, characterized as cold start operations in the Indian media.²⁵ This concept trades on the value of having mobilized operational forces always ready to conduct limited punitive strikes against Pakistan, sliding as suggested earlier under the threshold of Pakistan's red lines. In the case of cold start, however, the focus was no longer on striking terrorist training camps in Pakistan-held Kashmir but rather on striking high-value Pakistani military facilities in Pakistan proper.

Ostensibly, the cold start concept places a premium on elite strike force units of the Indian Army and Air Force cooperating in a combined arms framework, to reach across, or circle around, the opponent's concentrated defensive positions, to concentrate firepower on selected targets deeper in the opponent's territory, and to do so quickly. After achieving their initial objectives, the intruding forces would either secure, hold, and facilitate reinforcement of a band of occupied territory -- or withdraw -- before the main conventional ground forces (corps organizations with multiple divisions and ancillary brigades) could move to engage. The assumption, highly debatable, is that this would avoid the outbreak of a major conventional war.²⁶

Whether this cold start thinking is a form of public relations, a heuristic tool for military self-education, an exercise in feinting and the art of psychological warfare, or merely wishful thinking remains to be seen. Or like *ju jitsu*, it could be interpreted as a real military thought process that seeks a new operational concept that could draw the opponent's strike and defensive formations off balance. Pakistan's reliance on heavy ground forces and lackluster air force may have difficulty responding to rapid maneuvers that reached beyond their normal staging areas further into Pakistan's interior, even briefly. Those who dream of making India a so-called "hard state," and believe they must pursue that objective indirectly might view cold start as a vehicle for doing so.

While we may not know for some time whether the cold start concept will actually be adopted by the Indian military as the basis for operational planning, the thought process is indicative of a desire in at least some circles to be able to respond actively and militarily to Pakistani unconventional war provocations. This will affect Pakistani perceptions of contingencies that require military responses. It would not be surprising to find Pakistan's military doctrine

²⁵ Shishir Gupta, "No Eyeball to Eyeball Any More in New War Doctrine," *Indian Express*, March 6, 2004; "'Cold Start' to new war doctrine," *Times New Network*, April 14, 2004, <http://timesofindia.indiatimes.com/articleshow/616847.cms>.

²⁶ For a Pakistani military critique, see Brig. (retd.) Shaukat Qadir, "India's 'Cold Start' strategy," *The Daily Times* (Lahore), May 8, 2004 and "Cold Start: the nuclear side," *The Daily Times*, May 16, 2004.

becoming more receptive to the development and deployment of tactical nuclear weapons to counter India's cold start options.²⁷

NUCLEAR FORCE STRUCTURE AND STABILITY

Since May 1998, fragmentary information about Indian and Pakistani nuclear forces, operational capacity, and elements of command and control have emerged, although the numbers, readiness status, and employment plans for these nuclear delivery capabilities remain murky in many respects.²⁸ Currently, one can assume that each side has stockpiled at least fifty to sixty nuclear weapons (perhaps up to 100 in India's case) that can be prepared for use on short notice.²⁹ It is now generally accepted that both India and Pakistan initially developed airborne nuclear weapons suitable for external carriage by tactical ground-attack aircraft, while pursuing missile development programs. By 1998, both evidently were developing or had developed nuclear warheads shaped to fit the cylindrical confines of the front sections of short- and medium-range ballistic missiles, and these designs may have been validated in the May 1998 nuclear tests.

For airborne nuclear delivery, India apparently chose to configure the Mirage-2000H with pods for external carriage under the airframe belly, and possibly considered options to employ the Jaguar S(I), MiG-27M, and Su-30MKI as nuclear platforms, as well. For its part, Pakistan presumably relies on the F-16 (and has options to employ the older Mirage-5) for airborne atomic bomb delivery.³⁰

India and Pakistan also have developed and tested nuclear-capable, ground-based ballistic missiles, mounted on mobile launchers. India's existing missiles for missions against Pakistan are the single-stage, liquid-fueled *Prithvi* (a

²⁷ See the companion essay by Michael Krepon, Ziad Haider, and Charles Thornton, "Are Tactical Nuclear Weapons Needed in South Asia?"

²⁸ For a study of India's and Pakistan's nuclear capabilities, postures, and policies, see Rodney W. Jones, *Minimum Nuclear Deterrence Postures in South Asia - An Overview*, Final Report by Policy Architects International for DTRA/ASCO, October 2001, available at http://www.dtra.mil/about/organization/south_asia.pdf.

²⁹ Estimates of the annual output of weapons-grade nuclear material, quantifiable as "nuclear weapon equivalents," are compiled for both Pakistan and India through 2000 in Jones, *Minimum Nuclear Deterrence Postures*, Ibid. Projecting these numbers out to the year 2004 by the same methodology would suggest even higher figures could be achieved than the conservative stockpile estimates used here. *The Military Balance, 2003-04*, (London: IISS, 2003), Table 3, "Operational Nuclear Warheads," p. 229, attributes to India and to Pakistan forty-plus "sub-strategic" nuclear warheads each.

³⁰ Raj Chengappa's account suggests that India first attempted to mate externally carried nuclear weapons pods with the Jaguar and later shifted to the Mirage-2000 for this mission. See Chengappa, *Weapons for Peace*, op. cit., pp. 327 and 382-84. There is no reason to assume that India has limited its airborne nuclear strike weaponization to the Mirage-2000H. For Pakistan's nuclear-capable F-16, see Tariq Mahmud Ashraf, "Air Power Imbalance and Strategic Instability in South Asia," prepared for conference on Strategic Stability in South Asia, Naval Postgraduate School, Monterey, CA, June 30-July 1, 2004.

surface-to-surface adaptation of the Soviet SA-2 air defense missile in two versions, one rated for 150 km with a 1,000 kg payload, and the other for 250 km with a 500 kg payload), the two-stage *Agni* missile (demonstrated to ranges upwards of 1,200 km) that probably is to be based on railroad car launchers, and a more recently developed, Pakistan-specific, *Agni I* variant.³¹ India reportedly intends to retrofit its *Brahmos* adaptation of the Russian-supplied *Yakhont* anti-ship, cruise missile so that it can be fired either from naval ships or from Su-30 MK-I attack aircraft. This cruise missile apparently could be used as a standoff system with either conventional or nuclear weapons.³²

Pakistan has acquired several types of road-mobile, nuclear-capable ballistic missiles, shorter-range types being solid-fueled, and longer-range types that are liquid-fueled.³³ Comparable in range to the *Prithvi*, the *Hatf II (Abdali)* single-stage, solid-fuel missile probably has a range of between 180 and 200 km. The *Hatf III* single-stage, solid-fuel missile with a range of about 300 km, and the *Hatf IV (Shaheen)* single-stage, solid-fuel missile with a range of about 600 km, resemble the Chinese export types designated M-11 and M-9, respectively.³⁴

³¹ The *Agni* missile has been developed, reportedly, with distant China as well as nearby Pakistan in mind and has been tested in three versions, with a fourth, intended to be of longer range, under development. *Agni* originally was built in the late 1980s as a hybrid, using much the same liquid-fuel motors as the *Prithvi* for the second stage, and a solid rocket motor similar in size to the Scout Space Launch Vehicle for the first stage. The first variant (*Agni I*) was demonstrated in various tests to ranges between 900 and 1,200 km, and the second variant (*Agni II*) to ranges between 1,200 and 2,000 km, each with notional payloads of one ton (or 1000 kg). A third variant now officially (and confusingly) referred to as *Agni I* is specifically designated for missions against Pakistan and was tested with a one-ton payload on January 8, 2003 to a range of 700 km. This Pakistan-specific missile reportedly weighs twelve tons and evidently uses only solid-fuel propulsion. It presumably is lighter in weight than the variants with the liquid-fuel engines, and easier to mount on road-mobile transporter-erector launchers (TELs), or on the railroad launch cars India reportedly has been developing. A fourth variant (*Agni III*) intended for ranges closer to 3,000 km (using three solid-fuel stages) with a one-ton payload reportedly is under development. See *The Military Balance, 2003-2004*, (London: IISS, 2003), p. 131.

³² Ibid. The Russian *Yakhont* (and India's *Brahmos* variant) is a subsonic cruise missile carrying a solid-fuel kick-stage for a final boost of the payload to supersonic speed. Rated at 290 km in range when surface-launched using the supersonic boost-stage, the missile airframe may be capable of longer ranges if used only in a subsonic mode or when launched from aircraft. One may assume this cruise missile is nuclear-capable, if equipped with a small enough nuclear warhead. Whether India could deploy a nuclear-armed cruise missile without further warhead testing is unclear, but India claimed that low-yield (possibly miniaturized) nuclear weapon devices were included in the series of Indian nuclear tests on May 16 and 18, 1998.

³³ The *Hatf I* was based on a French-origin solid-fuel "sounding rocket," and was developed as a short-range battlefield missile with a range of about 60 km carrying a 500 kg payload. This system theoretically could be nuclear-capable but there are no credible reports that this is (or ever was) a nuclear-equipped missile. Although *The Military Balance, 2003-04*, op. cit., p. 140, lists an inventory of 80+ *Hatf I* missiles, others doubt that it is even in military service. The *Hatf II* may be a two-stage, end-to-end version of the *Hatf I* boosters, and, like the Indian *Prithvi*, would be considered nuclear-capable. It is possible that the inventory of 80+ missiles that *The Military Balance* reported actually should be attributed to the *Hatf II*.

³⁴ The Chinese designation of the M-9 is DF-15, and of the M-11 is DF-11. Note that some confusion exists in the various published sources regarding the Pakistani designations of its own missiles (e.g., on *Hatf* sequence numbers, and on the names *Shaheen*, *Shaheen II*, *Shadoz*, *Abdali*, and *Ghaznavi*). See the Federation of American Scientists website for discussion of the

Pakistan's longer-range *Ghauri I* (single-stage, 1,000-1,500 km range), reportedly now operational, and *Ghauri II* (two-stage, 2,500 km range), still in development testing, are liquid-fueled missiles that are believed to be based on the North Korean *No-dong* and *Taepo-dong* missiles, derived originally from Soviet Scud technology.

Classical strategic deterrence theory has tended to suggest that a robust level of nuclear deterrent stability between a pair of nuclear-armed rivals would depend on two interrelated conditions. First, each must have a credible capability for delivering nuclear weapons against valued targets in the opponent's homeland in sufficient numbers to dissuade the opponent from believing it could gain critical advantage by initiating nuclear war. Second, each must be able to count on the survivability of sufficient strategic nuclear assets in the event of a hypothetical preemptive strike by the opponent to be able to conduct a retaliatory strike that inflicts unacceptable damage.

This nuclear deterrence reasoning evolved from superpower experience during the Cold War. It also rested, in part, on extensive tactical nuclear weapons deployments and the credibility of extended deterrence protecting allies. Deterrence theorists did not suggest that limited conventional wars between the superpowers or allied coalitions were impossible, but that they would be too dangerous to initiate in Central Europe for fear of nuclear escalation. The result was the division of Europe in a political stalemate, until the Warsaw Pact and Soviet Union collapsed. Central strategic deterrence did not suspend geopolitical and military competition in other forms, nor did it preclude local wars through proxy states and entities outside Central Europe. But under the nuclear deterrence conditions then prevailing, especially after the Cuban missile crisis, the superpowers self-consciously steered away from initiating limited wars in Europe or direct collisions between their regular armed forces and those of European allies, even devising maritime rules to limit the risks of accidental naval military engagement on the high seas. They also eventually developed arms control agreements that served, among other purposes, to reduce the perceived risk of strategic preemption.

These conditions are clearly quite different from the situation that prevails in South Asia. While the east-west strategic confrontation was essentially bipolar, the Indo-Pakistan nuclear relationship is not isolated, at least in Indian perceptions, from China as a major Asian nuclear power. Another key difference between nuclear South Asia and the former superpower nuclear relationship is that a rough parity was established between the latter at both strategic nuclear and conventional levels. In South Asia, the conventional military relationship between Pakistan and India is asymmetrical and likely to become more so over time. Consequently, whatever tolerance each side may believe it has for

characteristics of these Chinese missile systems and what is believed to have been exported to Pakistan. For the M-9, <http://www.fas.org/nuke/guide/china/theater/df-15.htm>, and for the M-11, <http://www.fas.org/nuke/guide/china/theater/df-11.htm>.

experimentation with limited conventional conflict, this practice is exceedingly dangerous from the standpoint of nuclear stability, and absent a normalization of relations, it is likely to become more so. In a context in which limited conventional war is considered acceptable, it would seem likely that deployment of tactical and battlefield nuclear weapons in South Asia would further contribute to crisis instability.

The characteristics of Indian and Pakistani weapon systems, deployment procedures, and force structures generate other sources of instability. One is that India relies on calculated ambiguity regarding the warheads for its short-range *Prithvi* missiles.³⁵ Pakistan's ballistic missiles are inherently dual-capable as well, particularly the solid-fueled types with ranges between 200 and 600 kilometers. The Indian *Prithvi* was developed as a platform for both conventional and nuclear warheads by civilian technologists and imposed on the military, rather than designed or procured to support objective military requirements.³⁶ As far as India's Army and Air Force were concerned in the 1980s, the *Prithvi* would be militarily useful as an offensive bombardment missile for air base suppression, using conventional submunition warheads to destroy exposed aircraft, blast through hangars, and disrupt runways. But *Prithvi* also has been reported as having been tested and weaponized as a nuclear delivery system. When nuclear-capable *Prithvis* are launched with conventional ordnance against air bases, how would Pakistan know from its ground-based radar system that nuclear weapons are not on the way, or would not immediately follow? If Pakistan launches one or more M-11s or M-9s in the general direction of cities as well as military facilities in India, will Indian operators hold back action until they land to see if they are conventional or nuclear?

Theoretically, aircraft have the advantage of being recallable, unlike ballistic missiles. Aircraft can be scrambled for survivability or launched in a particular direction to warn of the preparedness to attack, but can turn around and return to airfields or dispersed landing strips, rather than actually carry out an attack. Once ballistic missiles are launched at real targets, they are committed; the recall option does not exist. This distinction between aircraft and missiles often discussed in the US-Soviet context means much less in the subcontinent, where India and Pakistan are contiguous and the flight distances between aircraft launch points and key targets on both sides are counted in a few minutes rather than in hours.

³⁵ The Indian government apparently has not officially declared the *Prithvi* missile to be a nuclear system, nor has it declared the missile to be an exclusively conventional system. Most of those who have followed *Prithvi's* development, however, including well-informed Indian journalists, have concluded that it is a nuclear-capable system and intended to send that message. Chengappa's account clarifies that the policy makers and the designers intended it to be a nuclear delivery system and he refers to work done to mate nuclear weapons to the *Prithvi* in 1996-97, just prior to its initial deployment at Jalandhar, near the Punjab border, in September 1997. (*Weapons of Peace*, Ibid., see pp. 319-320, 361, 418).

³⁶ See Raj Chengappa, *Weapons of Peace*, op. cit., pp. 374-75.

India's inclusion in its nuclear force structure of the *Prithvi* as a short-range, dual-capable, ballistic missile is inherently destabilizing. This missile has doubtful military utility unless equipped with a nuclear warhead and it has poor survivability characteristics. *Prithvi* must be positioned fairly close to the borders to be able to target air bases in Pakistan, but is, when so deployed, visible to air surveillance. A *Prithvi* system could easily be targeted and destroyed at its launch site by any state-of-the-art, ground-attack aircraft. Being liquid-fueled, it is slow to move to a pre-surveyed site and to prepare for a launch. Its liquid fuel makes the system highly combustible under attack. Although described as a mobile system, it is not easy to hide or move in a "shoot-and-scoot" mode, because of its ungainly design and large retinue of about a dozen support vehicles. Once in the field, it is a lucrative and vulnerable target for conventional attack.³⁷

Given that *Prithvi*'s commonly advertised mission is suppressing air bases with conventional munitions, Pakistan's Air Force would be virtually compelled, in the event India begins hostilities, to attack any *Prithvi* batteries it discovers near the border. Would such a strike cross an internally determined but never explicitly announced Indian red line? What if one or more *Prithvi* missiles were nuclear-tipped, and the bombing discharged a *Prithvi* nuclear warhead on Indian soil?

Forthcoming additions to India's conventional and nuclear-related force structure include the Israeli-supplied Phalcon airborne warning and surveillance system, and perhaps the Israeli Arrow ballistic missile defense system.³⁸ India and the United States are reported to have discussed the possibility of US supply of Patriot tactical ballistic missile interceptor systems.³⁹ Whether the Phalcon surveillance platform would be able to detect and track flights of Pakistani ballistic missiles in their boost, midcourse, or terminal phases (which involve different velocities and radar cross-sections) has not been disclosed, but seems doubtful. The Phalcon would enable India, however, to detect and track flights of Pakistani aircraft within a radius of up to 300 or 400 km from its flight position, providing warning of Pakistani air attack and intercept data for Indian

³⁷ Writing before the Indian and Pakistani nuclear tests in May 1998, Neil Joeck's trenchant critique of *Prithvi* is worth reviewing. See his *Maintaining Nuclear Stability in South Asia*, *Adelphi Paper* No. 312, (London: International Institute of Strategic Studies, 1997), pp. 68-69.

³⁸ The Arrow interceptor uses US-origin components and US approval is required for transfer. At this writing, no US approval has been announced. Israel reportedly has been transferring to India some version of its indigenously developed Green Pine phased array radar that Israel uses to detect and track the incoming missiles that Arrow interceptors are designed to engage.

³⁹ The first version of the American Patriot system was developed for air defense only. Currently, two Patriot systems, which represent distinct technological generations, are deployed or being produced as tactical anti-ballistic missile systems. The Patriot II interceptor uses a fragmentation (high-explosive) warhead as the kill vehicle, operates within the atmosphere, and would be considered a point-defense system. Patriot III uses a "hit-to-kill" (kinetic) kill vehicle with infrared sensors that function above the atmosphere, at higher altitudes, and thus provides limited area coverage. It's not clear whether Washington would be prepared to transfer Patriot III or share its kill vehicle technology with India.

fighter aircraft.⁴⁰ Pakistan has no comparable capability on order vis-à-vis India, although both fly unmanned air vehicles (UAVs) for surveillance close to the border.⁴¹ At the very least, India's Phalcon capability would be seen in Pakistan as increasing Pakistan's uncertainty about the penetration rate of its nuclear-delivery aircraft in the event they are called upon, and a strong incentive to acquire long-range surface-to-air missiles.⁴² These acquisitions reflect the existence of an ongoing arms competition that impinges on the nuclear balance, and therefore on the degree of mutual nuclear deterrent stability that might be achieved.

While the Phalcon would pose a new obstacle to Pakistani aircraft penetration, India's acquisition of theater anti-ballistic missile defense systems could reduce Pakistani missile penetration rates and thus could erode, at least marginally, the credibility of its missile deterrent. Depending on what missile interceptor systems India actually acquires and whether they could be used in ascent-phase and therefore area defense, as well as point defense, their deployment could shrink somewhat the areas from which Pakistani missiles would be safely launched and shorten their reach towards targets deep inside India. A greater Pakistani concern might be that these technology transfers would open the door for India to obtain even more sophisticated military technologies, offensive as well as defensive. Since Pakistan might not be able to acquire or afford active missile defenses of its own, its incentives in response would be to increase its inventory of offensive missiles, diversify the areas of mobile missile dispersal, develop penetration aids, procure sea-based launch platforms -- as India already plans -- and probably add cruise missiles as nuclear delivery platforms. If a competitive dynamic persists between India and Pakistan under these conditions, deterrent stability calculations would become more complex, the demands on command and control more severe, and the chances of accident and miscalculation greater.

NUCLEAR COMMAND AND CONTROL

An effective nuclear command and control system is vital to the projection of nuclear deterrent stability and exercise of escalation control during a military

⁴⁰ Precise figures for the power and range of the Phalcon's phased array radars and emission detection and location sensors are not publicly advertised but those for the aircraft detection and tracking radar are given as "several hundred kilometers," even for low-flying aircraft. See <http://www.globalsecurity.org/military/world/israel/phalcon.htm>.

⁴¹ Pakistan could, in principle, obtain some high-altitude surveillance functions from sensors held aloft by tethered balloons, and from other high-altitude, light aircraft with long loiter capability.

⁴² The response proposed by an experienced Pakistani Air Force pilot is acquisition of the Chinese mobile FT-2000/HQ-9 anti-radiation SAM system with a slant range of about 100 km, up to an altitude of 18 km, which would force Indian AWACS aircraft to stay well behind the international border and reduce the depth of their visibility into Pakistan. See Tariq Mahmud Ashraf, "Countering IAF AEW Capability: Options for the PAF," *Defence Journal* 81 (May 2004), pp. 111-115. For advertised characteristics of this Chinese high-altitude SAM system, see <http://www.sinodefence.com/airforce/airdefence/ft2000.asp> and <http://www.globalsecurity.org/military/world/china/ft-2000.htm>.

crisis.⁴³ The nuclear command and control system is the interface between political authority and nuclear weapons systems. The command and control system consists of personnel and hardware or related technologies. Failures can be either human or mechanical, or both. The objectives of a nuclear command and control system are to ensure even under the threat of impending war or initial hostilities that threat assessments, warnings of attack, and damage assessments are conveyed promptly and meaningfully to the top decision levels and that decisions made to alert or exercise nuclear weapons, or arm and launch them against assigned targets, if necessary, are implemented reliably and on time-sensitive schedules. Normally, a nuclear command and control system must integrate operators in different military services, each with distinct weapon systems and often with distinct organizational cultures, under a unified command. Command and control systems are vulnerable to failure or breakdown, and failures or breakdown during a time of crisis could be sources of catastrophic decisions or operational errors.

A robust command and control system is one that has built-in buffers to review and confirm intelligence assessments, redundant and hardened communication channels, protection against communication intercepts, methods to verify that communications are functioning throughout the system, and procedures to ensure safe and secure nuclear weapon custody and operation of delivery systems. But command and control centers may themselves be designated targets of nuclear attack, and even if they are not, are vulnerable to conventional war damage as well as nuclear effects. No modern nuclear command and control system has ever been tested under realistic conditions. Over time, new technologies and hardware were invented to help prevent unauthorized access or arming of nuclear weapons, to make nuclear weapons less sensitive to shock and fire, to ensure reliable communications over long distances, and to improve the survivability of weapons and communications links under attack.⁴⁴ The learning curve for developing and employing these technologies and procedures, and instilling them in personnel was incremental, long, and costly.

Western anxieties about Indian and Pakistani nuclear command and control reflect decades-long experience with nuclear safety, and other technical and procedural issues, coupled with uncertainty as to whether these generic difficulties are recognized and are being addressed effectively. One well-publicized western fear after September 11, 2001 was that al Qaeda or other terrorist networks might penetrate Pakistan's nuclear establishment and steal nuclear weapons or nuclear material. Another stems from the extraordinary doubts raised about the reliability of Pakistani physical security and personnel

⁴³ Military command and control systems today are often referred to in abbreviated form as C⁴I² which denotes "command, control, communications, computers, intelligence and (digital) information." The simpler formulation of "command and control" is used throughout this essay.

⁴⁴ For an overview, see Ashton B. Carter, John D. Steinbruner, and Charles A. Zraket, eds., *Managing Nuclear Operations* (Washington DC: The Brookings Institution, 1987).

reliability procedures following the disclosures in 2003-04 of Abdul Qadeer Khan's black market sales of Pakistani nuclear technology to Libya, Iran, and North Korea. While sensational disclosures of this kind have not arisen in the Indian context, concerns also exist about the generic integrity of Indian nuclear security measures against insider threats.

Little is known beyond anecdotal accounts whether, or specifically how, India or Pakistan may have resolved such generic nuclear command and control issues as assuring unbroken communications and central control over nuclear release authority in a crisis; ensuring nuclear weapons safety and security against handling accidents or inadvertent detonation of weapons in transit; executing alerting procedures of nuclear delivery systems without causing the other side to assume that an attack is imminent; and effectively sealing off access to nuclear weapon components and sensitive information from insider as well as outsider threats.

Much is made in Pakistan of the fact that a dedicated national command authority and nuclear command and control organization has been set up with multi-service involvement, suggesting that stored nuclear weapons are already under professional military custody and a designated organizational chain provides for their operational control by trained military units in the event of emergency. In India, much has been made of the fact that stored nuclear weapons components have been kept under civilian control and custody, the fissile cores in the Department of Atomic Energy's constellation of facilities, and the other components in the Defense Research and Development Organization (DRDO) facilities. Practitioners hint that operational procedures for military command and control over nuclear weapons at a time of need have been conceived and are being worked out pragmatically behind the scenes. India and Pakistan are understandably reticent about disclosing their technical approaches in this area for fear that public disclosures would compromise their nuclear security vis-à-vis each other and create risks of penetration by malefactors within their respective societies or international criminal networks.

Four potential structural challenges to escalation control under current command and control arrangements are worthy of comment. One already discussed is the limited geographical space for operations, especially for Pakistan, and the short flight times of delivery systems to targets, which place tremendous stress on intelligence and early warning. Another derives from existing limitations on national technical means of intelligence and surveillance that deprives both of adequate early warning. A third arises from the likelihood that the reported low-readiness status of nuclear weapons in India, and perhaps in Pakistan as well, would be transformed into permanently deployed systems at higher levels of readiness. The fourth arises from the potential temptation to deploy tactical and battlefield nuclear weapons, in addition to strategic forces that are presumably reserved for deterrence.

Feroz Khan in his companion essay provides an extensive discussion of the natural tension between centralized (assertive) control and decentralized (delegated) responsibility in the command and control hierarchy, as it relates to the precautionary dispersal of mobile ballistic missiles and stored nuclear warheads during a crisis, to protect the deterrent against possible preemptive attack. The same tension presumably exists with aircraft nuclear delivery systems, since dedicated aircraft and their armaments are also subject to dispersal in crisis. The issue is applicable to India as well, although perhaps less urgently in a crisis, because most Indian delivery systems -- with the exception of the *Prithvi* -- are likely to be located in India's interior beyond Pakistan's easy reach.

Ensuring the retention of central control (release authority) over mobile delivery systems -- whether aircraft or missiles -- becomes problematic in decapitation scenarios. In a nuclear war, communication links between central authorities and decentralized aircraft squadrons or missile units are likely to be disrupted. The desired central control criterion is to be able to preclude arming of air-delivered bombs or missile warheads until a positive command, presumably an encrypted one, is transmitted through secure channels. But if this communication on which field units depend could be disrupted, the usability and credibility of the deterrent forces may decline. To resolve this problem could entail delegating release authority, and whatever technical prerequisites that involves, ahead of time to the local commander. In the event national command links are broken, this could free the local commander to decide on his own initiative to dispatch aircraft (or, if airborne, to drop ordnance on targets) or launch live missiles, following predetermined plans. But this pre-delegation of launch authority also increases the chances that local commanders would make mistakes, panic, or take matters into their own hands. Pre-delegation also could play into the hands of a faction within the armed forces, or a rogue commander who has a war-triggering agenda, remote though these dangers may be. Being able to maintain a known capability for assured retaliation, even through pre-delegation, may be a critical ingredient in convincing an adversary to back away from continued confrontation, and to pursue de-escalatory actions instead.

Deployment of nuclear-equipped short-range missiles and gravity bombs as tactical nuclear weapons, or even closer-in battlefield nuclear weapons, would place much greater stresses on nuclear command and control systems by compressing response timelines further and by involving a much larger array of military operators. Aircraft squadrons and mobile missile units dedicated to strategic response would normally be segregated operationally from conventional battlefields, free to concentrate on a single deterrent mission. The use of nuclear weapons on the battlefield would inherently be escalatory and probably unpredictable in its impact on centralized decision-making.

MOVING FORWARD: PRACTICAL STEPS

The dispute over Kashmir and each side's jockeying to advance a solution on its own terms, using force to hold the line or to change the *status quo*, is the crux of the political and military conflict between India and Pakistan. The most fruitful way to avoid the negative consequences of structural imbalance between the two powers is to avoid military crises and limited war ventures, conventional and unconventional.

Nothing would do more to shrink the role of military crises and dampen enthusiasm for limited war initiatives in Indo-Pakistan relations than a durable solution on Kashmir. A durable solution would need to reflect the interests of Kashmiris. A step in this direction would be two-way freedom of Kashmiri movement, e.g., by opening the Srinagar-Muzaffarabad road to individual and legitimate commercial transit. Progress in negotiating a solution would be furthered by convincing Pakistani steps to disengage from the armed insurgency in the Indian-held areas. This could be demonstrated by active efforts to shut down the infiltration of armed Pakistani volunteers across the LoC, linked with equally convincing steps by India to scale down its extraordinarily large military and paramilitary presence deployed in the Valley and along the LoC to suppress the insurgency.⁴⁵ Genuine efforts by New Delhi are needed to find common ground with the mainstream dissident as well as militant indigenous Kashmiri groups on the future of Kashmir.

The United States has eschewed a mediating role in the Kashmir dispute, but has intervened politically during crises, as in Kargil, to facilitate disengagement of clashing forces. In mid-2002, the United States obtained implicitly linked commitments from Pakistan to block infiltration across the LoC, and from India to begin dialogue with Pakistan on Kashmir. With improved, if not always intimate relations with both sides, the United States should discreetly, patiently, and methodically encourage further conciliatory movement and negotiations by both countries.

With the Global War on Terrorism, US forces are now present in the region and PACOM and CENTCOM detachments carry out joint military exercises with India and Pakistan. It should be unmistakably clear that US military activities or support in no way signifies implicit approval for unilateral offensive operations, conventional or unconventional, by one country against the other. US security cooperation managers should quietly stress Washington's aversion to military exercises, plans, and pronouncements that have obvious escalatory potential, or are likely to put stress on nuclear use thresholds in either country.

⁴⁵ Ironically, redeployment of main line Indian Army units from Kashmir to the plains could actually increase the conventional ground force invasion threat to Pakistan, e.g., in the Punjab sector, at least in the near term, unless redressed by negotiated limits on conventional force concentrations near the border in peacetime.

The fact that the military structural imbalance in South Asia exists and is likely to widen suggests strong reasons for finding ways to assure the systemic safety, security, and stability of strategic and nuclear command and control arrangements. Cooperation in this area has been delicate, almost taboo, for legal and political reasons, and US or western actions would have to be carefully formulated and implemented to avoid treaty impediments. Nuclear Nonproliferation Treaty (NPT) restrictions forbid parties from assisting states to acquire or take control over nuclear weapons. This would prohibit direct assistance to new nuclear-weapon states with nuclear command and control. NPT obligations stand in the way of offering technical improvements or mechanisms for nuclear weapons, even to improve their safety against accidents or to retrofit safeguards against unauthorized use, because it is difficult to differentiate these features from ones that would also enhance the host's capability to deploy and use nuclear weapons. These restrictions would not necessarily stand in the way, however, of expert consultations focused on good practices and earlier lessons learned that could be applied to organizational, training, and safety procedures. Nuclear security consultations could provide an avenue for improving personnel screening and physical security practices. They could also provide an avenue for objective discussions on historical incidents, close calls, and things that could go wrong in foreseeable contexts, stimulating Indian and Pakistani examination and scrutiny of their approaches.

Cooperative threat reduction measures that might take hold in bilateral discussions between India and Pakistan should be encouraged. These could provide indirect buffers against certain command and control shortcomings, and generate commitments on both sides to develop effective accident-response, risk-reduction, and crisis management tools and procedures. Dialogue already exists on confidence-building measures that could serve these purposes, e.g., jointly staffed risk-reduction centers and regulations governing notification of missile flight tests, or tests of other systems, to forestall false nuclear alerts. The revitalization of certain confidence-building measures, such as the agreement concerning non-intrusion zones for military flights along the borders, could well serve nuclear stability purposes, as would agreed restrictions on the proximity to the borders of strike force concentrations. A variety of confidence-building and demilitarization measures related to reducing military tension and infiltration across the LoC in Kashmir have been circulated in bilateral working papers and reviewed in the analytical literature, and should be given serious consideration.

Given that the natural geographical and demographic basis of the military imbalance cannot be altered and that the imbalance will grow, it is necessary to think through the consequences of any major arms and technology transactions that would tilt the military imbalance even further. It would be reckless for the major supplier countries to ignore the effects on local military stability of major arms and military technology transfers to regions defined by new nuclear rivalries. Analyzing and adjudicating the effects on military balances and nonproliferation incentives of transactions in this issue area is not easy, but

failure to address these issues in comprehensive policy evaluations would be imprudent.

Russia, the United States, China, Iran, Saudi Arabia, and Israel each have major cards in their hands, whether in energy resources, financial capability, or arms transfer options that could affect nuclear stability concerns in South Asia. Ballistic missile and submarine acquisitions were important story lines in the 1990s, each having a nuclear subtext. Ballistic missile defense and airborne or overhead surveillance systems are at the head of the queue today. The introduction of cruise missiles has begun. Gaining improved means of early warning could contribute to crisis-prevention and nuclear stability, but this can depend in practice on whether the early warning is available to both sides, and on whether the instruments that serve early warning purposes are employed instead as offensive force multipliers, to guide missiles or aircraft to newly found targets. Missile defense is intrinsically appealing if it can buy time for crisis decision-making and bilateral communication, or for leadership and asset survivability, thus restraining the impulse to respond at the nuclear level. If, however, missile defense deployment is perceived to erode one side's deterrence credibility in favor of the other, or to multiply offensive options, it would have destabilizing effects.

The United States should seek better-calibrated policies towards its partners in South Asia than those in effect, following the twin shocks of the 1998 nuclear tests and of 9/11. Washington has had leverage in this region since 1999 that it did not have in the decade before, due to its improved post-Kargil relations with India and its post-9/11 relations with Pakistan. The United States cannot escape the national security priorities of the Global War on Terrorism, or the fact that key perpetrators of that terrorism were and still are embedded in this region. But nuclear security issues of the subcontinent need to be placed on at least an equal plane with the Global War on Terrorism. No one can afford to suffer through the consequences of a nuclear war in South Asia, or allow the peril of nuclear-armed terrorists to arise and migrate from this region. The chances of both are inextricably connected with the degree of continued nuclear rivalry and military confrontation between India and Pakistan. Winding down their mutual threats cannot be done without their willing engagement in cooperative objectives that can captivate popular support. This in turn is unlikely to crystallize without strong international affirmation and incentives. American leadership should endeavor to set that direction.