
THE PERILS OF PROLIFERATION IN SOUTH ASIA

Scott D. Sagan

On May 11 and 13, 1998, India tested five nuclear weapons in the Rajasthan desert. By the end of the month, Pakistan had followed suit, claiming to have detonated six nuclear devices—five to match New Delhi's tests and one in response to India's 1974 peaceful nuclear explosive test—at an underground facility in the Chagai Hills. With these tests, the governments in Islamabad and New Delhi loudly announced to the world community, and especially to each other, that they both held the capability to retaliate with nuclear weapons in response to any attack.

What will be the strategic effects of these nuclear weapons developments? Will the spread of nuclear weapons to South Asia bring stability to the region or lead to nuclear war? There are many scholars and defense analysts—some in the U.S. and many more in India and Pakistan—who argue that the spread of nuclear weapons to South Asia will significantly reduce, or even eliminate, the risk of future wars between India and Pakistan.¹ Following the logic of

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1. Devin T. Hagerty, *The Consequences of Nuclear Proliferation* (Cambridge, Mass.: MIT Press, 1998); David J. Karl, "Proliferation Pessimism and Emerging Nuclear Powers," *International Security* 21:3 (Winter 1996/97), pp. 87–119; and Kenneth N. Waltz, "More May Be Better" in *The Spread of Nuclear Weapons: A Debate*, eds. Scott D. Sagan and Kenneth N. Waltz (New York: W. W. Norton, 1995), pp. 1–45; Brahma Chellaney, "Naiveté and Hypocrisy: Why Anti-proliferation Zealotry Does Not Make Sense," *Security Studies* 4:4 (Summer 1995), pp. 779–86; K. Subrahmanyam, "Nuclear Force Design and Minimum Deterrence Strategy" in *Future Imperiled: India's Security in the 1990s and Beyond*, ed. Bharat Karnard (New Delhi: Viking Press, 1994), pp. 188–93; and Zafar Iqbal Cheema, "Pakistan's Nuclear Use Doctrine and Command and Control" in *Planning the Unthinkable*, eds. Peter R. Lavoy, Scott D. Sagan, and James J. Wirtz (Ithaca, N.Y.: Cornell University Press, 2000), pp. 158–81.

rational deterrence theory, these “proliferation optimists” argue that statesmen and soldiers in Islamabad and New Delhi know that a nuclear exchange in South Asia will create devastating damage and therefore will be deterred from starting any military conflict in which there is a serious possibility of escalation to the use of nuclear weapons.

Other scholars and defense analysts—some in India and Pakistan, and many more in the U.S.—argue the opposite: nuclear weapons proliferation in India and Pakistan will increase the likelihood of crises, accidents, and nuclear war.² These proliferation pessimists do not base their arguments on claims that Indian or Pakistani statesmen are irrational or that the Indian and Pakistani governments are weak. Instead, these scholars start their analysis by noting that nuclear weapons are controlled by military organizations and civilian bureaucracies, not by states or by statesmen. Organization theory, not just rational deterrence theory, should therefore be used to understand the problem and predict the future of security in the region. This organizational perspective leads the proliferation pessimists to focus on the pathways by which deterrence could fail, because of common organizational bias and errors, despite the unacceptable costs of any nuclear war.

These two theoretical perspectives thus lead to different predictions about the consequences of nuclear proliferation in South Asia. Fortunately, a new history of nuclear India and nuclear Pakistan is emerging, a history by which scholars and policy makers alike can judge whether the predictions of the deterrence optimists or the organizational pessimists have been borne out. Unfortunately, the emerging evidence strongly supports the pessimistic predictions of organizational theorists.

There are three requirements for stable nuclear deterrence: prevention of preventive war during periods of transition when one side has a temporary advantage; the development of survivable second-strike forces; and avoidance of accidental nuclear war. Each of these requirements will be examined in turn. I will first present the pessimistic predictions deduced from organization theory about difficulties governments will face in attempts to meet these nuclear stability requirements. I will then illustrate the resulting problems with historical examples concerning the U.S. and the Soviet Union during the Cold War. In each case, I will then show how very similar problems have already appeared or are emerging in India and Pakistan. Finally, the conclu-

2. Kanti Bajpai, “The Fallacy of an Indian Deterrent” in *India’s Nuclear Deterrent: Pokhran II and Beyond*, ed. Amitabh Mattoo (New Delhi: Har-Anand Publications, 1999), pp. 150–88; Samina Ahmed, “Security Dilemmas of Nuclear-armed Pakistan,” *Third World Quarterly* 21:5 (September 2000), pp. 781–93; Peter D. Feaver, “Proliferation Optimism and Theories of Nuclear Operations,” *Security Studies* 2:3/4 (Spring/Summer 1993), pp. 159–91; and Scott D. Sagan, “More Will Be Worse” in *The Spread of Nuclear Weapons*, pp. 47–91.

sions will then briefly outline both the lessons for theory development and the policy implications of the argument.

It should be acknowledged from the start that there are important differences between the nuclear relationship emerging between India and Pakistan and the Cold War system that developed over time between the U.S. and the Soviet Union. While the differences are clear, the significance of these differences is not. For example, the nuclear arsenals in South Asia are, and are likely to remain, much smaller and less sophisticated than was the case with the U.S. and Russian arsenals. This should make each arsenal both more vulnerable to a counterforce attack and less capable of mounting counterforce attacks, and thus the net effect is uncertain.

There are also important differences in civil-military relations in the two cases, but these differences too are potentially both stabilizing and destabilizing. The Russians and the Americans both eventually developed an assertive command system with tight high-level civilian control over their nuclear weapons. In contrast, India has an extreme system of assertive civilian control of the military, with (at least until recently) little direct military influence on any aspect of nuclear weapons policy. Pakistan, however, is at the other end of the spectrum, with the military in complete control of the nuclear arsenal and only marginal influence from civilian political leaders, even during the periods when there is a civilian-led government in Islamabad.

There are, finally, important differences in mutual understanding, proximity, and hostility. India and Pakistan share a common colonial and pre-colonial history, have some common cultural roots, and share a common border; they also have engaged in four wars against each other and are involved in a violent 50-year-long dispute about the status of Kashmir. In contrast, the Americans and Soviets were on opposite sides of the globe and viewed each other as mysterious, often unpredictable, adversaries. The Cold War superpowers held a deep-seated ideological rivalry but held no disputed territory between them and had no enduring history of armed violence against each other.

There is also, however, a crucially important similarity between the nuclear conditions that existed in the Cold War and those in South Asia today. In both cases, the parochial interests and routine behaviors of the organizations that manage nuclear weapons limit the stability of nuclear deterrence. In this article, I will demonstrate that serious organizational perils of proliferation, like those witnessed in the Cold War, are emerging in both India and Pakistan. The newest nuclear powers will not make exactly the same mistakes with nuclear weapons, as did their superpower predecessors. They are, however, also not likely to meet with complete success in the difficult effort to control nuclear weapons and maintain stable deterrence.

The Problem of Preventive War

From an organizational perspective, one can deduce three reasons why military officers have a bias in favor of preventive war. First, military officers are more likely than civilians to believe that war is inevitable in the long term, a belief that stems from both their self-selection into the profession and their training once they join the armed forces. If war is deemed inevitable in the long run, it makes sense to strike an enemy state before it is able to strengthen its retaliatory capabilities.

In addition, military officers have biases in favor of offensive doctrines. Offenses can bring decisive victories and glory and military officers often believe that offensive operations can take advantage of the principle of the initiative, enabling them to implement their own complex war plans and forcing adversaries to improvise and react to these plans, rather than implement their own. Preventive wars are by definition offensive in character and military planners have the tactical advantage of deciding when to attack and how to execute their war plan.

Finally, military officers are less likely than civilians to focus on domestic or international political disincentives against preventive war. By their training and their locus of responsibility, military officers focus primarily on military requirements of victory and not on concerns about allied states' concerns, post-war reconstruction and recovery in enemy states, or domestic political constraints on the initiation of the use of force.

American Preventive War Discussions

Considerable evidence from U.S. Cold War history supports these theoretical predictions. The Truman administration discussed the possibility of nuclear preventive war after the 1949 Soviet atomic bomb test, but rejected the idea in April 1950.³ That September, however, Major General Orvil Anderson, the commandant of the Air University, publicly called for a preventive war against the USSR, telling a *New York Times* reporter: "Give me the order to do it and I can break up Russia's five A-bomb nests in a week. . . . And when I went up to Christ—I think I could explain to Him that I had saved civilization."⁴

Anderson was fired for this indiscretion. But when widespread organizational preferences are rejected, they do not vanish overnight. Indeed, many senior U.S. military officers continued to advocate preventive war as a way of coping with the emerging Soviet threat well into the mid-1950s. Perhaps

3. NSC-68, in *Foreign Relations of the U.S.* (hereinafter FRUS followed by year and volume), 1950, vol. 1, *National Security Affairs*, pp. 281–82.

4. Austin Stevens, "General Removed over War Speech," *New York Times*, September 2, 1950, p. 8.

the most dramatic example was Air Force Chief of Staff General Nathan Twining who recommended a preventive attack on the Russians in 1954 before they developed larger nuclear forces. General Twining is quoted as saying that: “[W]e must recognize this time of decision, or we will continue blindly down a suicidal path and arrive at a situation in which we will have entrusted our survival to the whims of a small group of proven barbarians.”⁵

President Dwight D. Eisenhower rejected these recommendations in 1954, largely on grounds that even a successful nuclear first strike would lead to a long and costly conventional conflict with the Russians. Moreover, Eisenhower questioned whether war with the Russians was inevitable, given U.S. deterrent capabilities and the hope that containment would eventually lead to an overthrow of the Soviet system from within. Finally, although Eisenhower expected that the U.S. would win what he called a third world war, he also believed it would leave the U.S. with a dictatorial government, an isolationist public, and ill-prepared to occupy the vast territories of enemy nations.

In short, preventive war was advocated by senior leaders of the U.S. military for many years after the first Soviet nuclear test. It was eventually rejected, however, by senior civilian authorities who held strong views on the broader costs of such an attack and different beliefs about the inevitability of war with the Russians.

Brasstacks and Preventive War in South Asia

Pakistan has been under direct military rule for almost half of its existence and some analysts have argued that the organizational biases of its military leaders had strong effects on strategic decisions concerning the initiation and conduct of the 1965 and 1971 wars with India.⁶ In contrast, India has a sustained tradition of strict civilian control over the military since Independence.

These patterns of civil-military relations are highly influential in nuclear weapons doctrine and operations. In India, the military has traditionally not been involved in decisions concerning nuclear testing, designs, or even command and control. In Pakistan, the military largely runs the nuclear weapons program; even during the periods in which civilian prime ministers have held the reins of government, they have not been told of the full details of the nuclear weapons program nor given direct control over the operational arsenal. Prime Minister Benazir Bhutto, for example, appears not to have been

5. Memorandum by the chief of staff, U.S. Air Force (USAF), to the Joint Chiefs of Staff, “The Coming National Crisis,” August 21, 1953, Twining Papers, series 2, Topical Series, Nuclear Weapons 1952–61 folder, USAF Academy, Colorado Springs, Colo.

6. See Julian Schofeld, “Militarized Decision-Making for War in Pakistan: 1947–1971,” *Armed Forces and Society* 27:1 (Fall 2000); Sagan, “More Will Be Worse,” pp. 62–63; and Sumit Ganguly, *The Origins of War in South Asia* (Boulder, Colo.: Westview Press, 1986).

given full details of the status of the Pakistani nuclear weapons program before her visit to Washington in June 1989 and has stated that she was not consulted before the Pakistani military ordered the assembly of Pakistan's first nuclear weapon during the 1990 crisis over Kashmir.

This organizational theory lens suggests that it is fortunate that it was India, not Pakistan, that developed nuclear weapons first in South Asia. Military rule in Islamabad (and military influence during periods of civilian rule) certainly has played an important role in Pakistani decision-making concerning the use of force (see the discussion of the Kargil conflict below). But the Pakistani military did not possess nuclear weapons before India tested in 1974 and thus was not in a position to argue that preventive war now was better than war later as India developed a rudimentary arsenal.

The preventive war problem in South Asia is not so simple, however, for new evidence suggests that military influence in India produced serious risks of preventive war in the 1980s, despite strong institutionalized civilian control. The government of Prime Minister Indira Gandhi considered, but then rejected, plans to attack Pakistan's Kahuta nuclear facility in the early 1980s, a preventive attack plan that was recommended by senior Indian military leaders.⁷ Yet, as occurred in the U.S., the preferences of senior officers did not suddenly change when civilian leaders ruled against preventive war. Instead, the beliefs went underground, only to resurface later in a potentially more dangerous form.

The most important example of preventive war thinking influencing Indian nuclear policy can be seen in the 1986–87 Brasstacks crisis.⁸ This serious crisis began in late 1986 when the Indian military initiated a massive military exercise in Rajasthan involving an estimated 250,000 troops and 1,500 tanks, including the issuance of live ammunition to troops, and concluding with a simulated counter-offensive attack, including Indian Air Force strikes, into Pakistan. The Pakistani military, fearing that the exercise might turn into a large-scale attack, alerted military forces and conducted exercises along the border, which led to Indian military counter-movements closer to the border and an operational Indian Air Force alert. The resulting crisis produced a flurry of diplomatic activity and was resolved only after direct intervention by the highest authorities, including an emergency telephone conversation between Prime Minister Mohammed Khan Junejo and Prime Minister Rajiv

7. Kanti P. Bajpai, P. R. Chari, Pervaiz Iqbal Cheema, Stephen P. Cohen, and Sumit Ganguly, *Brasstacks and Beyond: Perception and Management of Crisis in South Asia* (New Delhi: Manohar, 1995), pp. 9–10; and George Perkovich, *India's Nuclear Bomb* (Berkeley: University of California Press, 1999), pp. 239–44.

8. This interpretation of Brasstacks was first presented as a speculative argument based on organization theory predictions in Scott D. Sagan, "Correspondence: Proliferation Pessimism and Emerging Nuclear Powers," *International Security* 22:2 (Fall 1997), p. 195.

Gandhi and special diplomatic missions to India by Foreign Secretary Abdul Sattar and President Zia ul-Haq.

The traditional explanation for the Brasstacks crisis has been that it was an accidental crisis, caused by Pakistan's misinterpretation of an inadvertently provocative Indian Army exercise. For example, Devin Hagerty's detailed examination of "New Delhi's intentions in conducting Brasstacks" concludes that "India's conduct of 'normal' exercises rang alarm bells in Pakistan; subsequently, the logic of the security dilemma structured both sides' behavior, with each interpreting the other's defensive moves as preparations for offensive action."⁹ A stronger explanation, however, unpacks New Delhi's intentions to look at what different Indian decision-makers wanted to do before and during the crisis.

The key to interpreting the crisis correctly is to understand the preventive war thinking of then-Indian chief of the army staff, General Krishnaswami Sundarji. According to one of his senior military associates, Sundarji felt that India's security would be greatly eroded by Pakistani development of a usable nuclear arsenal and thus deliberately designed the Brasstacks exercise in hopes of provoking a Pakistani military response. This in turn could then provide India with an excuse to implement existing contingency plans to go on the offensive against Pakistan and take out the nuclear program in a preventive strike.¹⁰ This argument was confirmed in the memoirs of Lt. General P. N. Hoon, the commander-in-chief of the Western Army during Brasstacks. He wrote:

What had remained only a suspicion all along is now being revealed to be true. . . . Brasstacks was no military exercise. It was a plan to build up a situation for a fourth war with Pakistan. And what is even more shocking is that the Prime Minister, Mr. Rajiv Gandhi, was not aware of these plans for war.¹¹

The preventive war motivation behind Sundarji's plans helps to explain why the Indian military did not provide full notification of the exercise to the Pakistanis and then failed to use the special hotline to explain their operations when information was requested by Pakistan during the crisis. A final piece of evidence confirms that Sundarji advocated a preventive strike against Pakistan during the crisis. Indeed, as George Perkovich reports, considerations of an attack on Pakistani nuclear facilities went all the way up to the most senior decision-makers in New Delhi in January 1987:

9. Hagerty, *The Consequences of Nuclear Proliferation*, pp. 92 and 106.

10. Raj Chengappa, *Weapons of Peace: The Secret Story of India's Quest to Be a Nuclear Power* (New Delhi: HarperCollins, 2000), pp. 322–23.

11. P. N. Hoon, *Unmasking Secrets of Turbulence* (New Delhi: Manas Publications, 2000), p. 102.

[Prime Minister] Rajiv [Gandhi] now considered the possibility that Pakistan might initiate war with India. In a meeting with a handful of senior bureaucrats and General Sundarji, he contemplated beating Pakistan to the draw by launching a preemptive attack on the Army Reserve South. This would have included automatically an attack on Pakistan's nuclear facilities to remove the potential for a Pakistani nuclear riposte to India's attack. Relevant government agencies were not asked to contribute analysis or views to the discussion. Sundarji argued that India's cities could be protected from a Pakistani counterattack (perhaps a nuclear one), but, upon being probed, could not say how. One important advisor from the Ministry of Defense argued eloquently that "India and Pakistan have already fought their last war, and there is too much to lose in contemplating another one." This view ultimately prevailed.¹²

The Kargil Conflict and Future Problems

Optimists could accept that the Brasstacks crisis may have been a deliberate attempt to spark a preventive attack, but they might be reassured by the final outcome, as senior political leaders stepped in to stop further escalation. The power of nuclear deterrence to prevent war in South Asia, optimists insist, has been demonstrated in repeated crises, e.g., the Indian preventive attack discussions in 1984, the Brasstacks crisis, and the 1990 Kashmir crisis. "There is no more ironclad law in international relations theory than this," Devin Hagerty's detailed study concludes, "nuclear states do not fight wars with each other."¹³

In the spring and summer of 1999, however, India and Pakistan did fight a war in the mountains along the Line of Control (LOC), separating the portions of Kashmir controlled by each country, near the Indian town of Kargil. The conflict began in May, when the Indian intelligence services discovered what appeared to be Pakistani regular forces lodged into mountain redoubts on the Indian side of the LOC. For almost two months, Indian army units attacked the Pakistani forces and Indian Air Force jets bombed their bases in the high Himalayan peaks. Although the Indian forces carefully stayed on their side of the LOC in Kashmir, Indian Prime Minister Atal Vajpayee informed the U.S. government that he might have to order attacks into Pakistan, and U.S. spy satellites revealed that Indian tanks and heavy artillery were being prepared for a counter-offensive in Rajasthan.

The fighting ended in July, when Pakistani Prime Minister Nawaz Sharif flew to Washington and, after receiving political cover in the form of a statement that President Bill Clinton would "take a personal interest" in resolving the Kashmir problem, pledged to withdraw the forces to the Pakistani side of

12. George Perkovich, *India's Nuclear Bomb*, p. 280.

13. Hagerty, *The Consequences of Nuclear Proliferation*, p. 184.

the LOC.¹⁴ That Clinton's statement on Kashmir was merely political cover for the withdrawal was later made clear when Clinton revealed that he had told Sharif that he could not come to Washington unless he was willing to withdraw the troops back across the LOC.¹⁵

Over 1,000 Indian and Pakistani soldiers died in the conflict and Sharif's decision to pull out was one of the major causes of the coup that overthrew his regime that October. The 1999 Kargil conflict is also disturbing, not only because it demonstrates that nuclear-armed states can fight wars, but also because the organizational biases of the Pakistani military were a major cause of the conflict. Moreover, such biases continue to exist and could play a role in starting crises in the future. This will increase the dangers of both a preventive and preemptive strike if war is considered inevitable, as well as the danger of a deliberate but limited use of nuclear weapons on the battlefield.

Three puzzling aspects of the Kargil conflict are understandable from an organizational perspective. First, in late 1998, the Pakistani military planned the Kargil operation paying much more attention, as organization theory would predict, to the tactical effects of the surprise military maneuver than with the broader strategic consequences. Ignoring the likely international reaction and the predictable domestic consequences of the military incursion in India, however, proved to be significant blind spots contributing to the ultimate failure of the Kargil operation. Second, the Pakistani Army also started the operation with the apparent belief—following the logic of what has been called the stability/instability paradox—that a stable nuclear balance between India and Pakistan permitted more offensive actions to take place with impunity in Kashmir. It is important to note that this belief was more strongly held by senior military officers than by civilian leaders. For example, at the height of the fighting near Kargil, Pakistani Army leaders stated that “there is almost a red alert situation,” but they nevertheless insisted “there is no chance of the Kargil conflict leading to a full-fledged war between the two sides.”¹⁶ This leaked statement to the press apparently reflected what the Pakistani Army was privately advising the government and helps explain why senior officers opposed the withdrawal of the Pakistani forces from Kargil.

Although Prime Minister Nawaz Sharif apparently approved of the plan to move forces across the LOC, it is not clear that he was fully briefed on the nature, scope, or potential consequences of the operation. The prime minister's statement that he was “trying to avoid nuclear war” and his suggestion

14. Bradley Graham and Nathan Abse, “U.S. Says Pakistan Will Withdraw,” *Washington Post*, July 5, 1999.

15. See “Pak Troops Withdrew from Kargil at My Insistence,” *Times of India*, June 3, 2001, at <<http://www.timesofindia.com/030601/03wor16.htm>>.

16. Ihtashamul Haque, “Peace Linked to Kashmir Solution,” Dawn Wire Service, June 26, 1999.

that he feared “that India was getting ready to launch a full-scale military operation against Pakistan” provide a clear contrast to the confident military assessment that there were virtually no risks of an Indian counter-attack or escalation to nuclear war.¹⁷

Third, the current Pakistani military government’s interpretation of the Kargil crisis, at least in public, is that Nawaz Sharif lost courage and backed down unnecessarily. This view is not widely shared among scholars or Pakistani journalists, but such a stab-in-the-back thesis does serve the parochial self-interests of the Pakistani army—which does not want to acknowledge its errors—and those of the current Musharraf regime.

The New Delhi government’s interpretation, however, is that Indian threats of military escalation, that a counterattack across the international border would be ordered if necessary, forced Pakistan to retreat. These different lessons learned could produce ominous outcomes in future crises: each side believes that the Kargil conflict proved that the other will exhibit restraint and back away from the brink in the future if their government exhibits resolve and threatens to escalate to new levels of violence.

Future military crises in South Asia are likely to be nuclear crises. Proliferation optimists are not concerned about this likelihood, however, because they argue that the danger of preventive war, if it ever existed at all, has been eliminated by the development of deliverable nuclear weapons in both countries after May 1998. The problem of preventive war during periods of transition in South Asia is only of historical interest now, optimists would insist.

I am not convinced by this argument for two basic reasons. First, the Indian government has given strong support to the Bush administration in its plans to develop missile defense technology and expressed interest in eventually procuring or developing its own missile defense capability in the future. The development of missile defenses in India, however, given the relatively small number of nuclear warheads and missiles in Pakistan, would inevitably reopen the window of opportunity for preventive war considerations. Military biases, under the preventive war logic of better now than later, could encourage precipitous action in either country if their government was seen to have a fleeting moment of superiority in this new kind of arms race, facing the dangerous possibility of the adversary catching up and surpassing it in the future.

The second reason to be pessimistic is that preventive war biases can have a background influence on considerations of preemptive war—that is, attacks based on the belief that an enemy’s use of nuclear weapons is imminent and

17. Pamela Constable, “Pakistan Aims to ‘Avoid Nuclear War,’” *Washington Post*, July 13, 1999; “U.S. Involvement Essential: PM,” Dawn Wire Service, July 10, 1999.

unavoidable—in serious crises. To the degree those decision-makers believe (or think that adversary decision-makers believe) that war is inevitable in the long term, it is likely to color the perceptions of the other side's actions and plans at the brink of war. Here the lessons of Kargil are ominous.

While it is clear that the existence of nuclear weapons in South Asia made both governments cautious in their use of conventional military force in 1999, it is also clear that Indian leaders were preparing to escalate the conflict if necessary. Pakistani political authorities, however, made nuclear threats during the crisis, suggesting that nuclear weapons would be used precisely under such conditions: Foreign Secretary Shamshad Ahmad, for example, proclaimed in May that Pakistan “will not hesitate to use any weapon in our arsenal to defend our territorial integrity.”¹⁸ In addition, Indian military officials believe that Pakistan took initial steps to alert its nuclear forces during the conflict.¹⁹

In future crises in South Asia, the likelihood of either a preventive or preemptive attack will be strongly influenced by a complex mixture of perceptions of the adversary's intent, estimates about its future offensive and defensive capabilities, and estimates of the vulnerability of its current nuclear arsenal. Organizational biases could encourage worst-case assumptions about the adversary's intent and pessimistic beliefs about the prospects for successful strategic deterrence over the long term. Unfortunately, as will be seen below, organizational proclivities could also lead to destabilizing vulnerabilities to an enemy first strike in the immediate term.

Organizational Problems Compromising Survivability

The fear of retaliation is central to successful deterrence and the second requirement for stability with nuclear weapons is therefore the development of secure, second-strike forces. From an organizational theory perspective, however, there are many reasons to predict that military organizations might not deploy nuclear weapons in survivable basing modes despite the existence of a strong national security imperative to do so.

Military leaders understandably favor development and deployment of more weaponry and with limited budgets, these interests often lead them to spend more on weapons production and skimp on expensive operational practices that increase survivability. Similarly, professional military officers have strong proclivities to engage in traditional operations and their interest in pre-

18. “Any Weapon Will Be Used, Threatens Pak,” *Hindu*, June 1, 1999.

19. Raj Chengappa, “Pakistan Tried Nuclear Blackmail,” *Newspaper Today*, January 12, 2000.

serving traditions and organizational morale can lead them to oppose innovative weapons delivery systems and deployment operations.

Even when their leaders do not consciously reject new military operations, organizations will tend to follow their past behaviors and may continue to practice specific deployments that make forces vulnerable to attacks when adversaries have developed new threats. To the degree that leaders of military organizations have offensive biases, they have increased incentives to rely upon first strike, preemptive, or launch-on-warning options that do not require force survivability.

Moreover, organizational learning tends to occur only after failures: military organizations, like other organizations, have few incentives to review and adjust operations when they believe they are successful. This can lead them to follow practices that appear to be working well, even though in reality they are not. At the same time, organizational routines often produce signatures to enemy intelligence agencies that inadvertently reveal secret information and the location of otherwise hidden military forces.

Cold War Vulnerabilities

The history of the Cold War provides numerous examples of these kinds of organizational problems producing inadvertent military vulnerabilities. In the 1980s, for example, the U.S. Air Force leadership strongly supported the development of a larger and more powerful intercontinental ballistic missile (ICBM), but they cared far less about whether the planned MX missile was deployed in any of the expensive basing modes—mobile racetrack configurations, railway basing, rotating them between empty silos—under discussion. In the 1950s, the United States Navy leadership also opposed the creation of a ballistic missile submarine fleet, because it preferred traditional and more exciting attack submarines. By emphasizing tradition over innovation, this policy delayed the development of what eventually became the most survivable leg of the U.S. strategic triad.

A dramatic example of how a military organization's operational routines can produce serious strategic vulnerabilities is the U.S. secret penetration of the Soviet Navy's underwater communications system. Ballistic missile submarines (SSBNs) are widely considered to be the least vulnerable portion on a nuclear arsenal, providing a stabilizing, secure second-strike capability. In the early 1970s, however, the U.S. Navy initiated a secret intelligence operation against the Soviet SSBN fleet that enabled the U.S. to know the timing and locations of Soviet submarine patrols in the Pacific and maintain a U.S. attack submarine trailing behind each Soviet SSBN. The organizational failures of the Russian military that led to this problem read more like the Keystone Kops than the KGB. First, the Soviets failed to encrypt many messages sent through an underwater communications cable in the Sea of Okhotsk to

the missile submarine base at Petropavlovsk, figuring that such protected waters were safe from U.S. spying activities. Second, to make matters worse, they gave away the location of the secret communications cable by posting a sign on the beach telling local fisherman "do not anchor, cable here." The crew of the U.S.S. *Halibut* thus easily located the line, tapped into the Soviet Navy's secret underwater communications, and received the operational plans and tactical patrol orders for the Russian SSBN fleet. It is important to note that the Soviet General Staff continued use of this vulnerable communication system, believing that their forces were secure unless proved otherwise, until an American spy revealed the secret operation to Moscow.²⁰

Soviet organizational routines also created vulnerabilities to their land-based nuclear missile forces during the Cold War. For example, the failure of the Soviet military to keep its 1962 missile deployment in Cuba secret, despite the strong desire for such secrecy by the Kremlin, was caused by construction crew routines that produced signatures leading American intelligence analysts to locate otherwise secret missiles. The Star of David pattern of air defense missile battery placements and the easily recognized slash marks on missile pads, practices developed and seen in the USSR, gave away the secret Cuban operation to American intelligence officers.²¹ Similarly, American photo-interpreters were able to locate the secret ICBM silos of the Soviet Strategic Rocket Forces because of the triple security fences built around the silo buildings and the distinctive wide radius curves in the entry roads, built to transport long missiles to the sites.²² These kinds of organizational problems are common in military history, as intelligence agents figure out how to understand enemy operations and make them vulnerable to attack.

Survivability of Nuclear Forces in South Asia

Will such organizational problems exist with nuclear weapons arsenals in South Asia? Before the 1998 nuclear tests, proliferation optimists used to assume that second-strike survivability would be easily maintained because India and Pakistan had a form of non-weaponized deterrence and thus could not target each other. It is by no means certain, however, that this condition of non-weaponized deterrence will continue as both India and Pakistan develop advanced missiles in the coming years.

20. See Sherry Sontag and Christopher Drew, *Blind Man's Bluff: The Untold Story of American Submarine Espionage* (New York: Public Affairs, 1998), pp. 158–230.

21. Graham Allison and Philip Zelikow, *Essence of Decision* (New York: Longman, 1999), p. 208; and Dino A. Brugioni, *Eyeball to Eyeball: The Inside Story of the Cuban Missile Crisis* (New York: Random House, 1990), pp. 277–88.

22. Dino A. Brugioni, "The Art and Science of Photo Reconnaissance," *Scientific American* 274:3 (March 1996), pp. 78–85.

An organization perspective points to numerous reasons to be concerned about the ability of the Indian and Pakistani organizations that control nuclear weapons in South Asia to maintain survivable forces. Two organizational problems can already be seen to have reduced (at least temporarily) the survivability of nuclear forces in Pakistan. First, there is evidence that the Pakistani military, as was the case in the Cold War examples cited above, deployed its missile forces, following standard operating procedures, in ways that produced signatures, giving away their deployment locations. Indian intelligence officers thus identified the locations of planned Pakistani deployments of M-11 missiles by spotting the placement of defense communication terminals nearby.²³ A second and even more dramatic example follows a Cold War precedent quite closely. Just as the road engineers in the Soviet Union inadvertently gave away the location of their ICBMs because construction crews built roads with extra-wide-radius turns next to the missile silos, Pakistani road construction crews have inadvertently signaled the location of the secret M-11 missiles by placing wide-radius roads and roundabouts outside special garages at Sargodha Missile Base.²⁴

Military biases are also seen in conventional war plans in India. Indian military officers are clearly planning large-scale conventional force operations against Pakistani airbases, using U.S. Paveway II laser guidance bombs. These operations could present Pakistan with serious "use it or lose it" problems and serious degradation in their command and control of nuclear weapons, yet these are inadvertent escalation dangers that have not been discussed at all in the emerging Indian strategic writings on limited war in South Asia. Instead, these strategists simply assume that limited wars can be fought and won, without creating a risk of precipitating a desperate nuclear strike.

Finally, analysts should also not ignore the possibility that Indian or Pakistani intelligence agencies could intercept messages revealing the secret locations of otherwise survivable military forces, an absolutely critical issue with small or opaque nuclear arsenals. Indeed, the history of the 1971 war between India and Pakistan demonstrates that both states' intelligence agencies were able to intercept critical classified messages sent by and to the other side. For example, the Pakistanis learned immediately when the Indian Army commander issued operational orders to prepare for military intervention against East Pakistan; while before the war, Indian intelligence agencies acquired a copy of the critical message from Beijing to Rawalpindi informing the Pakistanis that China would not intervene militarily in any Pakistani-In-

23. N. Prasanna, "Spark of Hope," *Week*, September 28, 1997.

24. John Diamond, "Satellite Shows Pakistan's March toward Nuclear Capability," *Chicago Tribune*, March 16, 2000, p. 10.

dian war.²⁵ Perhaps most dramatically, on December 12, 1971, the Indians intercepted a radio message scheduling a meeting of high-level Pakistani officials at Government House in Dhaka, which led to an immediate air attack on the building in the middle of the meeting.²⁶

The Kargil conflict also provides evidence of the difficulty of keeping what are intended to be secret operations secret from one's adversary. Throughout the conflict, the Pakistani government insisted that the forces fighting on the Indian side of the LOC were *mujahideen* (indigenous Islamic freedom fighters). This cover story was exposed, however, when some of the *mujahideen* failed to leave their Pakistani military identification cards at their base in Pakistan, while others wrote about General Musharraf's involvement in the operation's planning process in a diary that was later captured.²⁷ Finally, Indian intelligence organizations intercepted a critical secret telephone conversation between General Musharraf and one of his senior military officers, which revealed the Pakistani Army's central involvement in the Kargil intrusion.²⁸

The Risks of Accidental Nuclear War

Social science research on efforts to maintain safe operations in many modern technological systems suggests that serious accidents are likely over time if the system in question has two structural characteristics: high interactive complexity and tight-coupling. Complexity is problematic in hazardous systems because it decreases the likelihood that anyone can predict all potential failure modes and thereby fix them ahead of time. Moreover, the most common engineering strategy to make reliable systems out of inherently unreliable parts is to utilize redundancy in many forms such as multiple safety devices, backup systems, and extra personnel assigned to a problem. Redundancy, however, makes the system more complex and can therefore create hidden failure modes that no one wants or anticipates.²⁹

Tight coupling simply means that there is little time to stop processes once begun, little slack in the system to permit pause and reflection. Incidents and

25. Richard Sisson and Leo E. Rose, *War and Secession: Pakistan, India, and the Creation of Bangladesh* (Berkeley: University of California Press, 1990) pp. 199, 225.

26. Asoka Raina, *Inside RAW: The Story of India's Secret Service* (New Delhi: Vikas Publishing House, 1981), pp. 60–61.

27. Shisher Gupta, "Major's Diary Exposes Pak's Involvement," *Hindustan Times*, July 10, 1999, p. 1; and *From Surprise to Reckoning: The Kargil Review Committee Report*, pp. 21 and 97.

28. The whole transcript is available at the Institute of Peace and Conflict Studies home page, at <<http://www.ipcs.org/documents/1999/2-apr-jul.htm#Tapes>>.

29. Scott D. Sagan, "Toward a Political Theory of Organizational Reliability," *Journal of Contingencies and Crisis Management* 2:4 (December 1994), pp. 228–40.

individual accidents still occur in loosely-coupled systems, but they do not cascade into catastrophic systems accidents.

In tightly coupled systems, however, one error leads to another and another and no one can intervene in time to stop the serious accidents from occurring. Highly complex and tightly coupled organizational or technological systems may operate successfully for a while, but they are very accident-prone over the long term. In short, there are inherent limits to safety with such systems.

The Limits of Cold War Safety

Two close calls to accidental nuclear war that occurred during the Cuban Missile crisis illustrate the way in which complex and tightly coupled systems can create serious nuclear dangers that no one can anticipate ahead of time or fix easily on the spot.³⁰ In October 1962, the U.S. Air Force had 10 test missile silos at Vandenberg Air Force Base (AFB), in California, which it used for launching test missiles over the Pacific to Kwajalein Atoll. When the crisis alert began, the Strategic Air Command (SAC) put nuclear warheads on nine of the 10 test missiles at the base and aimed them at the Sino-Soviet bloc. On October 26, without further communication with Washington political authorities, officers at Vandenberg launched the 10th missile on a previously scheduled test launch over the Pacific Ocean. No one thought through the possibility that the nuclear alert might be detected and that the subsequent missile launch might be misperceived.

Another illustrative case occurred in the special Cuban Missile Early Warning System set up by the U.S. during the crisis. U.S. military personnel set up an emergency radar system facing Cuba, but no one anticipated that a technician would place a training tape (showing what an attack would look like) into the online system and that the radar operators would become confused and report that a Soviet missile had been launched from Cuba and was about to detonate near Tampa, Florida. Precisely such a set of unexpected interactions did occur on October 28 at the height of the crisis. These incidents are the kind of false warnings and near accidents that a normal accident theorist would predict are inevitable in a complex and tightly coupled nuclear command and control system.

Normal Accidents in Nuclear South Asia

Will the Indian and Pakistani nuclear arsenals be more or less safe than were the U.S. and Soviet arsenals in the Cold War? It is clear that the emerging South Asian nuclear deterrence system is both smaller and less complex today than was the case in the U.S. or Soviet Union earlier. It is also clear,

30. Scott D. Sagan, *The Limits of Safety: Organizations, Accidents, and Nuclear Weapons* (Princeton, N.J.: Princeton University Press, 1993), pp. 78–80 and 130–31.

however, that the South Asian nuclear relationship is inherently more tightly coupled because of geographical proximity.

With inadequate warning systems in place and with weapons with short flight times emerging in the region, the time lines for decision making are highly compressed and the danger that one accident could lead to another and then lead to a catastrophic accidental war is high and growing. The proximity of New Delhi and Islamabad to the potential adversary's border poses particular concerns about rapid decapitation attacks on national capitals. Moreover, there are legitimate concerns about social stability, especially in Pakistan, that could compromise nuclear weapons safety and security. These concerns have increased as a result of the potential for domestic strife in Pakistan that could follow the war against the Taliban regime in Afghanistan.

Proliferation optimists will cite the small sizes of India and Pakistan's nuclear arsenals as a reason to be less worried about the problem. Yet, the key from a normal accidents perspective is not the numbers but rather the structure of the arsenal. Here, there is good and bad news. The good news is that under normal peacetime conditions, India, and most likely Pakistan as well, does not regularly deploy nuclear forces mated with delivery systems in the field. The bad news is that, as noted earlier, the Indian military has stated that it received intelligence reports that Pakistan had begun initial nuclear alert operations during the Kargil conflict.

From an organizational perspective, it is not surprising to find evidence of serious accidents emerging in the Indian nuclear and missile programs. The first example is disturbing, but predictable. On January 4, 2001, Indian Defense Secretary, Yogender Narain, led a special inspection of the Milan missile production facility in Hyderabad. The Milan missile, a short-range (two km) missile normally armed with a large conventional warhead, had failed in test launches and during the Kargil war, and Narain was to discuss the matter with the plants' managers and technical personnel. For reasons that remain unclear, the electrical circuitry was not disconnected and the live conventional warhead was not capped on the missile displayed for the visiting dignitary from New Delhi when the plant manager accidentally touched the start button. The missile launched, flew through the body of one official, killing him instantly, and then nose-dived into the ground, catching on fire and injuring five other workers. The defense secretary was shocked but unharmed. The official killed was the quality control officer for the Milan missile program.³¹

The false warning incident that occurred just prior to the Pakistani nuclear tests in May 1998 is a second case demonstrating the dangers of accidental

31. "Doubts over BDL Safety Norms," *Hindu*, January 9, 2001; and "One Killed as Missile Misfires during Demonstration," *Times of India*, January 5, 2001.

war in South Asia. During the crucial days just prior to Prime Minister Sharif's decision to order the tests of Pakistani nuclear weapons, senior military intelligence officers informed him that the Indian and Israeli air forces were about to launch a preventive strike on the test site.³² The incident is shrouded in mystery and neither the cause nor the consequences of this warning message are clear. Some press reports claim that Pakistani intelligence officers, fearing an Israeli raid like the attack on Osirak in 1981, misidentified an F-16 aircraft that strayed into or near Pakistani territory. Other reports state that an Israeli cargo plane carrying Prime Minister Benjamin Netanyahu's armored Cadillacs triggered the warning system. A third possibility is that officials of Pakistan's Inter-Service's Intelligence agency did not believe there was any threat of an imminent Indian-Israeli attack in 1998, but deliberately concocted (or exaggerated) the warning of a preventive strike to force the prime minister, who was wavering under U.S. pressure, to test the weapons immediately. It is not clear which of these is the more worrisome interpretation of the incident: false warnings could be catastrophic in a crisis whether they are deliberate provocations by rogue intelligence officers or genuinely believed, but inaccurate, reports of imminent or actual attack.

It is important to note that the possibility of a false warning producing an accidental nuclear war in South Asia is reduced, but by no means eliminated, by India's adoption of a nuclear no-first use policy. Not only might the Pakistani government respond, following its stated first-use doctrine, to intelligence (in this case false) that India was about to attack successfully a large portion of Pakistani nuclear forces, but either government could misidentify an accidental nuclear detonation, occurring during transport and alert activities at one of their own military bases, as the start of a counterforce attack by the other state.

Pakistani officials should be particularly sensitive to this possibility because of the memory of the 1988 Ojheri incident in which a massive conventional munitions explosion at a secret ammunition dump near Rawalpindi caused fears among some decision-makers that an Indian attack had begun. The cause of the Ojheri explosion appears to have been a fire caused by an accidental rocket explosion during loading at the depot. It has also been claimed, however, that the accident was actually a deliberate act of sabotage against the munitions dump.³³ This kind of accident producing a false warning of an attack cannot, however, be ruled out in India as well, as long as the

32. "Pakistan Probably a Stronger Country than Most Pakistanis Think—U.S. Ambassador," *Dawn Magazine*, July 19, 1998; and Shahid-ur-Rehman, *Long Road to Chagai* (Islamabad: Print Wise Publications, 1999), pp. 115–16.

33. Muhammad Yousaf and Mark Adkin, *The Bear Trap: Afghanistan's Untold Story*, at <<http://www.afghanbooks.com/beartrap/>>; and Samina Ahmed and David C. Cortright, "Going Nuclear: The Weaponization Option" in *Pakistan and the Bomb: Public Opinion and Nuclear*

government plans to alert forces or mate nuclear weapons to delivery vehicles during crises.

Organization theorists would also suggest that it is important to focus on the degree to which organizational structures and incentives exist in both countries to fix safety problems once they occur. Unfortunately, there is a lack of independent regulatory systems in both countries. In both states, learning from past mistakes is therefore limited because the organizations in charge are not forced by regulatory agencies to scrutinize their operations or adjust after errors are detected. In Pakistan, there is no independent group to provide checks and balances to the military planners or scientists. In India, a nuclear regulatory body exists, but it lacks sufficient independence to ensure that the nuclear power and nuclear weapons "strategic enclave" changes its procedures after accidents or near accidents. In the nuclear power industry, for example, when nuclear reactor safety problems were identified by the chairman of the Atomic Energy Regulatory Board, he was dismissed from his position; the situation is even worse at the nuclear weapons-related facilities at the Bhabha Atomic Research Center, where the safety board is appointed by the director of the organization it is meant to monitor.

In addition, there should be serious concern about whether both countries can maintain centralized authority over nuclear-use decisions. Although government policy in this regard is kept classified, for obvious reasons, the need for some form of predelegation is recognized by serious analysts in both countries who are worried about decapitation of the government leadership in a nuclear strike on the capital. Some Pakistani observers are aware of this issue and therefore have advocated predelegation of nuclear authority to lower level military officers. The Indian Draft Nuclear Doctrine simply states that "the authority to release nuclear weapons for use resides in the person of the Prime Minister of India, or the designated successor(s)," yet some Indian analysts also recognize that in crises or war, as one military officer put it, "by design or default" nuclear weapons "control may pass to the professional military men and women who serve the nation well."³⁴

The risk of accidental war in South Asia is exacerbated by the fact that neither government has instituted a Personnel Reliability Program (PRP), the set of psychological screening tests, safety training, and drug use and mental health monitoring programs used in the U.S. to reduce the risk that an unstable civilian or military officer would be involved in critical nuclear weapons or command and control duties. Historically in the U.S. between 2.5% and

Options, eds. Samina Ahmed and David C. Cortright (Notre Dame, Indiana: University of Notre Dame Press, 1998), p. 96.

34. Colonel Gurmeet Kanwal, "Command and Control of Nuclear Weapons in India," *Strategic Analysis* 23:10 (January 2000), p. 1728.

5% of previously PRP-certified individuals were decertified, that is, deemed unsuitable for nuclear weapons related duties, each year.

Presumably similar low but still significant percentages of officers, soldiers, and civilians in other countries would be of questionable reliability as guardians of the arsenal. This personnel reliability problem is serious in India, where civilian custodians maintain custody of the nuclear weapons. However, it is particularly worrisome in Pakistan, where the weapons are controlled by a professional military organization facing the difficult challenge of maintaining discipline in the midst of a society facing a failing economy, serious social problems, and growing religious fundamentalism.

Finally, there is evidence that neither the Indian nor the Pakistani military has focused sufficiently on the danger that a missile test launch during a crisis could be misperceived as the start of a nuclear attack. There was an agreement, as part of the Lahore accords in January 1999, to provide missile test advance notification, but even such an agreement is not a foolproof solution, as the Russians discovered in January 1995 when a bureaucratic snafu in Moscow led to a failure to pass on advance notification of a Norwegian weather rocket launch that resulted in a serious false warning of a missile attack. Moreover, both the Pakistanis and the Indians appear to be planning to use their missile test facilities for actual nuclear weapons launches in war. In India, Wheeler Island is reportedly being used like Vandenberg AFB, a test site in peacetime and crises, and a launch site in war.³⁵ During Kargil, according to the Indian army chief of staff, nuclear alert activities were also detected at “some of Pakistan’s launch areas—some of the areas where they carried out tests earlier of one of their missiles.”³⁶

Conclusions: Beyond Denial

Nuclear South Asia will be a dangerous place. This will be the case, not because of ill-will or irrationality among government leaders nor because of any unique cultural inhibitions against strategic thinking in both countries. India and Pakistan face a dangerous nuclear future because they have become like other nuclear powers. Their leaders seek perfect security through nuclear deterrence, but imperfect humans inside imperfect organizations control their nuclear weapons. If my theories are right, these organizations will someday fail to produce secure nuclear deterrence. Unfortunately, the evidence emerging from these first years of South Asia’s nuclear history suggests that this theoretical perspective is powerful and its pessimistic predictions are likely to

35. Raj Chengappa, “Missiles: Boom for Boom,” *India Today International*, April 26, 1999, pp. 28–30.

36. Raj Chengappa, “Pakistan Tried Nuclear Blackmail,” *Newspaper Today*, January 12, 2000.

come true, even though we cannot predict the precise organizational pathway by which deterrence will break down.

This perspective on the consequences of nuclear proliferation in South Asia provides important and related lessons for both theory and for policy. Most Indian and Pakistani scholars and government analysts have followed on traditional pathways blazed by American nuclear strategists: they produce policy recommendations about arsenal structure and targeting plans, based on the seductive and deductive logic of rational deterrence theory. Less common are studies focusing on the complex organizational and operational problems that nuclear weapons create for those who possess them.

There is great need for more work in this area, however, because nuclear weapons in South Asia present several new theoretical puzzles that have not been thoroughly analyzed. There are several questions that must be asked in future research. What important behavioral differences are likely to exist between organizations that manage nuclear weapons that are run primarily by civilians (India) and similar organizations run entirely by military officers (Pakistan)? Will organizational biases grow stronger during crises, when there is insufficient time for detailed civilian or even military leaders' intervention in detailed operational plans? How do common military biases change when a military officer assumes a senior political post: does where he sit determine how he stands on nuclear issues or does he carry the intellectual baggage of training in military organizations along with him to the new post? How broad a shadow do nuclear weapons cast in South Asia? Kargil demonstrated that they have not prevented all wars between nuclear states. But what kinds of limited wars are likely in the future? And how can they remain limited?

The organizational perspective suggests that there are more similarities than differences between the nuclear powers and the way they manage, or at least try to manage, nuclear weapons operations. There is, however, one important structural difference between the new nuclear powers and their Cold War predecessors. Just as each new child is born into a different family, each new nuclear power is born into a different nuclear system because other nuclear states exist and influence behavior. This phenomenon, however, is in theory likely to have contradictory effects on nuclear crisis behavior. On the one hand, the ability of other nuclear powers to intervene in future crises may be a major constraint on undesired escalation. On the other hand, this ability may encourage the governments of weaker states to engage in risky behavior—initiating crises or making limited uses of force—precisely because they anticipate (correctly or incorrectly) that other nuclear powers may bail them out diplomatically if the going gets rough.

The possibility that other nuclear states can influence nuclear behavior in South Asia does lead to one final optimistic note. There are many potential

unilateral steps and bilateral agreements that could be instituted to reduce the risks of nuclear war between India and Pakistan, and the U.S. government can play a useful role in helping to facilitate such agreements. Many, though not all, of the problems identified in this article can be reduced if nuclear weapons in both countries are maintained in a de-mated or dealerted state, with warheads removed from delivery vehicles, either through unilateral action or bilateral agreement. U.S. assistance could be helpful in providing the concepts and arms verification technology that could permit such dealerting (or non-alerting in this case) to take place within a cooperative framework. The U.S. could also be helpful in providing intelligence and warning information, on a case-by-case basis, in peacetime or in crises to reduce the danger of false alarms. In addition, safer management of nuclear weapons operations can be encouraged through discussions of organizational best practices in the area of nuclear weapons security and safety with other nuclear states.

There will be no progress on any of these issues, however, unless Indians, Pakistanis, and Americans alike stop denying that serious problems exist. A basic awareness of nuclear command and control problems exists in New Delhi and Islamabad, but unfortunately Indian and Pakistani leaders too often minimize them. The August 1999 Indian draft doctrine report, for example, claimed that "nuclear weapons shall be tightly controlled," that command systems "shall be organized for very high survivability against surprise attacks," and that "safety is an absolute requirement."³⁷ But it did not explain how such lofty goals could be confidently achieved. Government officials in New Delhi sometimes speak as if nuclear safety problems have been successfully addressed, as when Ministry of Defense officials told parliamentarians in July 1998 that the nuclear weapons safety procedures "have been revised and updated in keeping with requirements in this regard."³⁸ For their part, senior Pakistani authorities have claimed that the problem of accidental nuclear war has already been solved. A. Q. Khan, for example, has claimed that "Pakistan has a flawless command and control system" for nuclear arms, and former Foreign Minister Sartaj Aziz insisted that there was "no chance" of an accidental nuclear war in South Asia.³⁹

The U.S. government refused to assist the Pakistanis in developing improved safety and security for their nuclear weapons until the September

37. Draft Report of National Security Board on Indian Nuclear Doctrine, August 17, 1999, on the Embassy of India in the U.S. home page at <http://www.indianembassy.org/policy/CTBT/nuclear_doctrine_aug_17_1999.html>

38. Raj Chengappa, "Worrying over Broken Arrows," *India Today*, July 13, 1998.

39. "Pakistan Has Flawless Control for Nuclear Arms: Qadeer," *News* (Islamabad), October 4, 1998, in Foreign Broadcast and Information Service, FBIS-TAC-98-277, October 4, 1998; and "No Chance of Accidental N-War: Pakistan Sets Up Effective Command System," *Dawn*, November 30, 1998.

2001 terrorist attacks and the war in Afghanistan highlighted the danger of al-Qaeda members or Taliban supporters stealing a weapon or nuclear materials from a storage site. Prior to September 11, Washington officials argued that any assistance in this area would reward Islamabad for testing and signal other potential nuclear weapons states that the U.S. is not serious about its non-proliferation goals. An even more serious concern is that sharing specific technological devices and information could be counterproductive if it encourages Pakistan to mate warheads and bombs to delivery vehicles and to deploy weapons into the field in the belief that these operations would now be safe. Any future nuclear security assistance program should therefore focus on encouraging safe and secure storage, transport, and maintenance of nuclear materials, components, and warheads. It should not include technical assistance or studies of organizational best practices regarding nuclear alert operations such as mating warheads to missiles or transporting fully assembled weapons. The principle behind U.S. nuclear assistance should be to focus on organizational practices and technologies that would encourage Pakistan to maintain its nuclear components stored separately and not mated to delivery vehicles. Future programs with India should have the same focus.

A first useful step for the U.S. is to accept that nuclear weapons will remain in Pakistan and India for the foreseeable future and that the problem of Kashmir will not be solved easily or quickly. The political problems between the two South Asia nuclear problems may someday be resolved. Until that day comes, the U.S. government has a strong interest in doing whatever it can to reduce the risk that India and Pakistan will use nuclear weapons against each other.