

Viewpoint

Managing Proliferation in South Asia: A Case for Assistance to Unsafe Nuclear Arsenals

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Over three years ago, the series of nuclear explosions in South Asia removed any hope that nuclear weapons (NW) would remain "in the closet." Since then India and Pakistan have gradually developed their respective nuclear systems and plans,¹ and little real progress has been made to reduce the dangers. The very real fears that the two newest declared nuclear weapon states could unleash their arsenals over the Kashmir issue were recently joined by deep concerns that Pakistani NW could either be seized by rogue fundamentalists in its own military dissatisfied with President Musharraf's support of the U.S. bombing campaign in Afghanistan, or even have been provided outright to the Taliban or the al-Qa'ida terrorist network. More plausible is the potential transfer of NW know-how and/or radioactive materials for a radiological "dirty" bomb by individual Pakistanis² to remnants of al-Qa'ida³ or others, possibly other states.⁴ These dangers have suddenly transformed the U.S. national interest from preventing nuclear war in South Asia to halting an attack on its *own* shores. Given these major shifts in the strategic environment, the United States must explore new proliferation policies that make the most of a bad situation.

In order to reduce the chances of an inadvertent nuclear exchange occurring in South Asia, or of elements of the South Asian arsenals being used against others, U.S. policymakers should adopt a novel solution to help "manage" proliferation in this case. Given the dangers involved, the U.S. government should transfer selected U.S. nuclear weapon command and control (C2) systems to India and Pakistan. The objective would be to transform inherently destabilizing nuclear arsenals into forces less likely to be fired in anger or error, or transferred to third parties. Adequate, reliable, and time-proven nuclear C2 is required, whether the weapons remain largely unmated with delivery systems or whether they have at times been mated and operationally deployed. The world has lived precariously with the former situation for several years and just recently appears to have been faced with the latter. In short, the nuclear rubicon has been crossed.

This viewpoint attempts to address questions concerning why these countries developed NW, and why it will be hard to force them to abandon them. Paying special attention to unique challenges in South Asia, it asks whether NW inherently improve stability or not. The overriding questions to tackle are: can nuclear C2 mitigate prob-

lems associated with NW? Where do the shortfalls exist in the nuclear C2 arrangements of India and Pakistan? This study will look at these issues with a view to recommending where the United States should lend assistance. Despite constraints on such support, the long-term necessity of preventing unauthorized weapons/material transfer or a nuclear exchange via “managed” proliferation outweighs the barriers to protecting a principled “zero-proliferation” stand. The United States must, in the words of one commentary, “delink issues of nuclear safety from nuclear proliferation...[and] redefine the nonproliferation regime in a more realistic manner.”⁵

THE RATIONALE FOR DEVELOPING NUCLEAR ARSENALS

As much as there have been controversy and speculation regarding the nuclear test results in 1998,⁶ so too are there disputes about whether the NW of South Asia are normally deployed or disassembled.⁷ There is disagreement as to the precise numbers and types of current/projected warheads and delivery vehicles, and what the costs would be for a projected nuclear arsenal.⁸ It is not surprising to find that there is also disagreement as to why the two countries developed NW to begin with. Yet, despite this dispute, in many respects India and Pakistan share many of the same deep-seated insecurity concerns that gave birth to their nuclear weapon programs.

While short-term domestic factors in India, such as the weak coalition government and a desire to appease the nuclear scientific-technical cabal,⁹ may have forced New Delhi’s hand in performing the 1998 tests, these explanations alone are insufficient to explain why India developed NW in the first place. While some argue that the country’s nuclear program served “as the vehicle of national self expression...[and] the goals of national identity construction,”¹⁰ several long-term geopolitical factors were also at play. India has long held a genuine fear of the Chinese military threat, and Beijing’s support of Islamabad’s nuclear and missile programs intensified this concern. Doubts concerning the extent of its superpower patron’s security guarantee during the Soviet era, and the later collapse of the Soviet Union, exacerbated India’s unease. Finally, the leaders in New Delhi were motivated by a desire for prestige and respect in the international community.¹¹

If India’s rationale for developing a nuclear arsenal is complex, Pakistan’s impetus appears to be simple: a cost-effective reaction to India’s overwhelming military capa-

bilities. Still, the same long-term *realpolitik* factors that drove India to nuclearization are also relevant in the case of Pakistan. Pakistan feared its larger neighbor (India) and believed its superpower patron (the United States) to be notoriously unreliable.¹² Unlike India, however, Pakistan also tied and has continued to press—however heavily-handedly—the linkage between its nuclear program and the seemingly ineluctable Kashmir issue.¹³ For Pakistan, its NW program is also ostensibly a bargaining chip to be used to resolve the Kashmir issue, a tactic that is fraught with danger and miscalculation.

In other words, the roots of the Indian and Pakistani nuclear programs run very deep. In the words of one analyst, “India and Pakistan...are as unlikely to give them [nuclear weapons] up as were Washington and Moscow at the height of the Cold War.”¹⁴ Furthermore the same factors that motivated India and Pakistan to develop NW are pressuring them to expand and deploy them. As a result, it will be difficult, if not impossible, to force either country to disable or destroy its nuclear arsenal. Even if the root causes for developing their NW disappear, the weapon program itself continues to generate powerful bureaucratic and public advocacy for its continued existence.¹⁵ The world is thus faced with NW in both India and Pakistan for the foreseeable future, a situation that led former U.S. President Bill Clinton to call South Asia “the most dangerous place on earth.”¹⁶

NUCLEAR WEAPONS, GREATER STABILITY: EXTRAPOLATING THE COLD WAR ONTO SOUTH ASIA

Of course, many analysts counter that such a provocative claim is more hype than reality. They argue that now that both countries have come “out of the nuclear closet,” there is improved stability between India and Pakistan. After all, did not the nuclear stalemate between the United States and the Soviet Union produce greater stability in *their* relations? Does not the “long peace” of the Cold War prove that NW engender sufficient caution in what would otherwise have been a hot and deadly conflict between the superpowers? From this point of view, if nuclear deterrence worked for the much more massive arsenals of the United States and Soviet Union, it might also work for the much smaller arsenals of India and Pakistan.

Kenneth Waltz, the leading proponent of such thinking, has argued that “the gradual spread of NW is more to be welcomed than feared.”¹⁷ Many observers of South Asia have taken up Waltz’s position, arguing that the

nuclear programs force India and Pakistan to adopt a more cautious, less bellicose approach toward each other. In their view, the possibility of large-scale, deliberate conventional conflict between the two states has lessened considerably, and “nuclear deterrence ultimately compelled restraint, de-escalation, and disengagement on both sides.”¹⁸ Some analysts even suggest that an inadvertent or accidental war arising over Kashmir is now highly improbable.¹⁹

However, such an optimistic faith in nuclear deterrence does not bear strong scrutiny. True, there was never any nuclear exchange between the United States and the Soviet Union, but several times the two countries came close to the precipice by design (e.g., the 1973 Yom Kippur War) or by inadvertence (e.g., the 1962 Cuban missile crisis). Maintaining nuclear stability is not an easy task; stability takes great conscious effort as does the safety, security and accountability of nuclear warheads and materials from unauthorized transfer and theft. There is a strong conceptual argument which posits that the longer a state has NW or the greater the number of states with NW, the greater the chance of a nuclear exchange. Lewis Dunn best summed up the “nuclear pessimists” opinion that nuclear deterrence will eventually fail when he wrote, “as more countries acquire the bomb, the number of situations in which a political miscalculation, leadership failure, geographical propinquity, or technical mishap could lead to a nuclear clash will increase.”²⁰ The pessimists’ bottom line is that luck has so far kept a nuclear holocaust at bay. Unless other compensatory measures are taken, they argue, it will only be a matter of time before a nuclear exchange takes place or terrorists gain access to nuclear weapons.

NUCLEAR WEAPONS, DECREASED STABILITY, AND RISKY BEHAVIOR: REALITIES OF SOUTH ASIA

Still, one may contend that there is no reason the luck enjoyed by the Soviet Union and the United States should not also apply to India and Pakistan. However, the nature of the U.S.-Soviet rivalry was far different and less volatile than that in South Asia.²¹ Unlike India and Pakistan, the United States and the Soviet Union did not have common and disputed borders. Neither state suffered from military coups or faced widespread separatist movements, and they were not surrounded by those seeking to steal NW and radioactive materials.²² Most importantly, they both had the luxury of time and distance to reduce the

pressures of an inadvertent launch or an overly provocative launch on warning posture.²³ In contrast to the somewhat controlled superpower stand-off, the Indo-Pakistani situation is more akin to a prolonged Cuban missile crisis. In South Asia, the crisis atmosphere and risks of miscalculation “would be permanent rather than temporary, would occur without adequate command, control, communications, and intelligence (C3I) in place, and with political leaderships located less than five minutes from mutual Armageddon.”²⁴ For India and Pakistan, NW might have bought strategic stability, but at the cost of crisis stability. It would be hard to upset the balance as it is, but once that balance were upset—and the NW were assembled and deployed—it would be hard to restore. Certainly the current situation is not an encouraging start.

Nuclear weapons may actually encourage risk-taking with regard to peripheral, non-vital issues. During the Cold War, the United States and the Soviet Union engaged in numerous proxy wars, taking care not to directly impinge upon the other’s vital interests. In the same vein, India and Pakistan may believe that nuclear arsenals now give them greater leeway to foment internal dissent or launch terrorist attacks in the other’s territory.²⁵ No doubt Pakistan’s increased support of the Kashmiri separatist movement has been encouraged by its sense that its nuclear deterrent would force India into demurring from launching a major conventional counter-attack across the line of control.²⁶ The same rationale probably held true in the minds of various Pakistani leaders during the country’s abortive incursion into Kargil in spring 1999 as well as the suicide attack on the Indian Parliament in December 2001. At the end of the day, due to the historical distrust between the two states, what one mistakenly views as peripheral, the recipient might view as vital. The stage is set for potential escalation into nuclear exchange, potentially arising from a conventional conflict or even an accidental nuclear detonation.²⁷

Furthermore, there is evidence that Pakistan already threatened India with nuclear reprisal during several recent crises. Journalist Seymour Hersh argued that in the crises of 1986 and 1990, Pakistan openly flexed its nuclear muscle to convince India to back down by launching a public information campaign (1986) and by deploying NW to front line units (1990).²⁸ Although Hersh’s findings are certainly open to question, there is one lesson that Pakistan, if not also India, learned. By making it *appear* that it had dramatically raised the ante in the crisis, Pakistan ensured U.S. involvement to defuse it.²⁹ The temptation

now exists to play the nuclear card to ensure third-party assistance in future conflicts, to otherwise play an odd game of “mediated chicken.” As Professor Stephen Cohen recently noted with regard to the recent Indo-Pakistani crisis, “[count] on the United States to jerk the steering wheel so the Pakistanis do swerve out of the path of an on-rushing Indian vehicle.”³⁰ Eventually, however, this bluff may be called. For a bluffing country to keep the threat credible and not be faced with an opponent supremely confident in its conventional superiority alone,³¹ pressures will mount to do more than just make empty rhetorical flourishes. This dynamic could trigger the deployment of NW during such a crisis.

Already strains are evident in Indian and Pakistani self-control at avoiding nuclear saber-rattling. Reports surfaced on the possible nuclearization of the 1999 Kargil crisis, most notably in the journal *Foreign Policy*, where an unnamed diplomat stated that India and Pakistan “came very close to a nuclear exchange.”³² Additionally, the Indian Army Chief of Staff claimed that Pakistan threatened to use NW in Kargil if the conflict escalated out of control.³³ Although a nuclear-armed India clearly exercised a great deal of self-restraint during the Kargil crisis,³⁴ senior Indian military officials who met with a delegation from the U.S. Air War College two years later opined that Kargil would be the last time they would “let Pakistan get away with provocation.”³⁵ In short, NW do not automatically deter provocations by or counter-attacks against a nuclear foe.

In the face of an openly declared nuclear adversary, and once having admitted that it too would resort to NW if forced, any country would be hard-pressed not to eventually field its nuclear arsenal—however much it may see it as a tool of deterrence rather than an instrument of warfighting. An exception to such a blanket pronouncement might be made in the cases of South Africa (which never deployed NW operationally) and Israel (which may have deployed NW during crises but never declared that it had done so). Yet, once a country comes “out of the nuclear closet,” and once it feels sufficiently threatened to actually contemplate their use, the next logical step would be to take the weapons “out of the basement” by operationally deploying mated weapons during peacetime, or at least during crises. The most recent Indo-Pakistani crisis in December 2001 may have proved this dire prediction true: reports indicate that not only were conventional forces deployed all along the border, but that ballistic missiles and NW were also readied by both countries.³⁶ In

the words of an anonymous U.S. intelligence official speaking about the crisis, both countries had “their nukes in place and ready to roll.”³⁷ If anything, even after a crisis, there might be pressure by the military (using worst-case scenario planning) to keep warheads mated to delivery systems. In doing so, national leaders could preclude this factor as a warning indicator during an actual crisis, in order to retain the elements of secrecy and surprise. In this case, the issue will center on whether the arsenal can be deployed safely, whether safety brakes can be added to the nuclear juggernauts that India and Pakistan have built, and the establishment of procedures to indicate when such safety brakes should be applied.

NUCLEAR COMMAND AND CONTROL (C2): INCREASING STABILITY

Nuclear C2 can provide increased security in the South Asian context by:

- increasing the physical security and stability of the Indian and Pakistani nuclear arsenals;
- providing mutual assurance between India and Pakistan; and
- improving the credibility of mutual deterrence.

Several factors increase the stability of a deployed nuclear arsenal and help to ensure safety from theft or accidental or inadvertent use: (1) preferred political and military behaviors; (2) consistent level of day-to-day operational readiness; and (3) the full scope of nuclear arsenal safeguards.³⁸ Over the lifetime of a nuclear arsenal, a control system is used more often to ensure that the NW are *not* stolen or fired accidentally or inadvertently than it is for the authorized launch of the weapons. For this reason, C2 plays a vitally important factor in the prevention of an inadvertent or accidental nuclear conflict; it also helps preclude the theft of nuclear materials, warheads, and associated delivery systems by rogue or third parties. Harkening back to the U.S.-USSR stand-off, the development of strict C2 safeguards bought the superpowers time—both short-term (to prevent theft, accidents, and inadvertent launches) and long-term (to establish strategic arms control agreements, confidence-building measures (CBMs), etc., to back away from the nuclear precipice)—to enhance the element of blind luck.

A secondary if overlooked purpose of nuclear C2, particularly pertinent in the South Asian case, is to provide mutual reassurance during the endemic crises between and within India and Pakistan. Several factors can play major roles in successful crisis management and de-escalation

control. These include: knowing that there are no rogues in the nuclear C2 chain of the other country; believing that the chances for dangerous misunderstandings and misperceptions have been sharply reduced; and accepting that one's own control is unchallenged (from internal or external threats).³⁹ Such assurance is vital not only to the two South Asian antagonists, but it is equally important to their domestic population, neighboring states, and extra-regional powers, like the United States, that may be indirectly or directly the target of a nuclear attack.

Finally, C2 also improves the credibility of nuclear deterrence. An effective C2 system deters an adversary and provides reassurance that one is in control and not liable to strike in error or lose control of warheads and radioactive materials to terrorists or rogue elements. According to one observer,

the deterree must see how well run the deterrer's command system is, thereby gaining confidence in mutual deterrence...both sides [must] fully understand that command and control systems are not the apparatus to launch nuclear war, but the government agency that creates deterrence by communicating through the deterree's command system.⁴⁰

Even if some would continue to argue that the Indian and Pakistani nuclear arsenals are as inherently self-stabilizing as were the U.S. and Soviet arsenals, none could argue against the need for a system to secure and control those forces. After all, the Cold War competitors employed comprehensive C2 safeguards. Clearly C2 is a vital if under-recognized element in a stable and safe nuclear deterrent.

Obviously there is also a countervailing pressure to ensure the arsenal is responsive to the needs of the country's leadership, in case the unthinkable comes to pass. An overly elaborate set of C2 safeguards, while ideal for theft prevention, would make any arsenal useless, negate any intended deterrent effect, and might even tempt an adversary to launch a preemptive strike. As with all things, C2 has its darker flip-side: the warfighting function of a nuclear arsenal (i.e., the dissemination of launch orders by authorized personnel to nuclear equipped forces in the event that deterrence breaks down). The nuclear irony is that to deter (and thus hopefully never to fire or be fired upon in anger), an adversary must perceive that NW can be launched quickly in the event deterrence fails.

This balance between the desire to keep tight control of NW (stability/safety) and to ensure their use should

the need arise (credibility) is what Peter Feaver calls the "negative/assertive" versus "positive/delegative" C2 conundrum. Negative control refers to the prevention of NW release, while positive control means the permissive release of the weapons. Conversely, assertive control indicates that authority to launch NW is highly centralized and tightly circumscribed, while delegative control implies the decentralization of authority to launch the weapons, presumably once certain criteria are met.⁴¹ Although the conundrum cannot be completely solved, the key to crisis stability is to what degree a nuclear C2 system tends to one or the other extreme. As Feaver writes, "the assertive/delegative distinction...indicates the likely failure modes of the command system....A delegative system...would tend to 'fail deadly' [while] assertive command systems would tend to 'fail safely'."⁴² In short, a predominantly "fail-safe" negative/assertive command system (one in which the prevention of NW release or unintentional use is centrally controlled),⁴³ while not a panacea, is at least a good start to help India and Pakistan back away from potential nuclear catastrophe.⁴⁴

SHORTFALLS IN INDIAN AND PAKISTANI NUCLEAR COMMAND AND CONTROL (C2)

Before examining shortfalls in South Asian C2, it is important to develop a working definition, since many that recommend sharing C2 fail to adequately define it. For the purposes of this paper, nuclear C2 consists of:

- (1) weapons safety and security safeguards to ensure NW are not transferred or launched by unauthorized personnel;
- (2) intelligence and early warning networks to determine whether an adversary is executing a nuclear strike; and,
- (3) nuclear-critical information flow to keep senior leadership informed of the status (e.g., readiness, accountability, security) of nuclear forces, enable quick and reliable communications to weapon operators, and permit revision or reversal of decisions.

Nuclear C2 is supported by: (1) a stable (and preferably constitutionally established) decisionmaking process; and (2) exercises that reassure oneself and one's adversary that the weapons will neither be easy targets of theft nor launched inadvertently. To a limited degree, some of these elements exist in South Asia. Unfortunately for both India and Pakistan, "inadequate warning systems are in place in the region, time-lines for decisionmaking are highly compressed, command and control arrangements are not

clear, and communications links are not robust."⁴⁵ As a result, a great deal more is required to give India and Pakistan "time" and "distance" to eventually establish strategic arms control agreements and CBMs.

Various South Asian officials have stressed their understanding of the requirement for a secure and reliable C2 system for their arsenals. India has been particularly active in establishing its C2 requirements in its draft nuclear doctrine.⁴⁶ Several members of the Indian academic and defense intellectual communities have outlined in great detail what it takes to control nuclear forces, including a mixture of hardened and mobile command posts.⁴⁷ However, one suspects that New Delhi is nowhere near meeting these expectations anytime soon.

In comparison, Pakistan has generally been more reluctant than India to openly delineate its long-term nuclear C2 requirements. Until very recently, Pakistan relied upon simple declarations that it maintains a "flawless command and control system,"⁴⁸ and that a national Nuclear Command Authority was established in the persons of the Prime Minister (now President Musharraf operating under martial law), several cabinet ministers, and the Chairman of the Joint Chiefs of Staff Committee. Further details have since surfaced regarding the composition and functioning of several committees and a planning division within the Joint Strategic Headquarters to oversee NW development, deployment, and employment.⁴⁹ Still, what Islamabad foresees as its *ideal* C2 requirements is a matter of conjecture. Clearly, even if it wished to emulate the extensive control system publicly envisioned by some in New Delhi, it is likely that it could not afford the expense.

The limited evidence suggests that for now both countries have inadequate nuclear C2 structures in place, and that this condition will persist for the foreseeable future.⁵⁰ Despite Western warnings that "action on warheads and delivery systems not get ahead of less glamorous but essential (and often costly) steps for the secure management of nuclear forces... [e.g.,] control, safety, communications, intelligence,"⁵¹ there is a historical preference for bureaucracies to prefer warheads and delivery vehicles over the less glamorous C2.⁵²

Questionable Nuclear Safety and Security Safeguards

Currently, security in India and Pakistan against an unauthorized or inadvertent launch appears to be assured only by keeping the warheads and their delivery systems

separate.⁵³ This is at best a stop-gap measure that would be—and has already been—undone the minute either country operationally deploys its NW. Security against theft can only be assumed to be a combination of armed guards, rudimentary physical controls, and maintaining high secrecy regarding the locations of the warheads. Additionally, it is certainly prudent to at least relocate unassembled/unmated nuclear warheads and other components, as well as to beef up defensive military forces around weapons sites during a crisis (as Pakistan did following U.S. air strikes in Afghanistan⁵⁴). However, these are temporary measures that can be undone by a disaffected insider and may even inadvertently send an opponent the wrong signal that weapons are being readied for use, not deployed for their safety. Furthermore, the very act of transporting warheads from place to place increases the risk of theft or accidental detonation.

A necessary component to comprehensive NW security is electronic locks, but speculation suggests that these are not being employed on Indian and Pakistani warheads. Such locks would guard against an unauthorized launch and render a stolen device useless. There appears to be some future promise of India developing and implementing protective measures, such as: the two-man rule (requiring two vetted individuals to inspect/repair/move/launch/detonate a nuclear device); permissive action links (PALs) (preventing a nuclear detonation unless proper electronic codes have been entered); and environmental sensing devices (permitting a detonation only when certain delivery parameters, such as speed or altitude, have been reached). When and whether one or both countries will implement these measures is unknown.

Most worrisome is the nature of Pakistan's NW safety design. If Pakistan's weapons design is based upon the Chinese system, as widely alleged, it is very likely that the Pakistani arsenal—like the Chinese—lacks sufficient technological barriers to inadvertent, accidental, or unauthorized use. Even if Pakistan were to adopt the Chinese organizational alternative to technological safety features (i.e., establishing a nuclear warhead control organization independent of the strategic delivery forces, in addition to keeping warheads removed from their delivery vehicles), two problems remain. First, when successive governments cannot guarantee regime stability, there are questions with regard to ensuring the organization's constant loyalty to the authorized decisionmakers. Given Pakistan's history of military coups and an officer corps increasingly divided between a somewhat liberal Westernized minority of se-

nior leaders and a more radicalized, immoderate cohort of mid-level officers, there is reason to worry.⁵⁵ Second, since Pakistan is likely to eventually deploy armed NW as part of a normal peacetime posture, the protection afforded by separated components will evaporate. Fortunately, Pakistan has expressed interest in both indigenous and foreign-developed fusing, safety, and arming systems.⁵⁶

Troubling Intelligence and Early Warning Networks

The challenge for nuclear safety and control systems is to determine not only what the adversary is doing, but also what he is *not* doing.⁵⁷ Intelligence and early warning networks can have a great impact on confidence-building and crisis de-escalation. If a country's warning systems reliably indicate there are no impending preparations for a nuclear strike by the adversary, the chance of worst-case miscalculation drops. However, in a climate of increased tensions and historic mistrust, the absence of reliable threat information can easily lead to a worst-case assessment of the other's intentions and potentially even pre-emptive strikes.⁵⁸ Imperfect intelligence only serves to exaggerate, not resolve, inherent propensities to assume the worst about the adversary.⁵⁹ Additionally, intelligence against possible theft and diversion of nuclear warheads is constrained by overlapping and competing intelligence bureaucracies, some of which might pursue agendas contrary to the government's desires.⁶⁰ In the end, poor intelligence is often worse than none at all and, unfortunately, quite common in South Asia. Neither India nor Pakistan has an objective and effective intelligence service, due to: inadequate and inappropriate collection capabilities;⁶¹ organizational disconnects; an undue focus on covert operations and domestic rather than foreign intelligence; and typically politicized analysis.⁶²

As with many of their colleagues around the world, South Asian decisionmakers often ignore analyses that do not fit their preferred policies and preconceptions. Their track record, particularly India's, in correctly interpreting and acting on intelligence reports has been dismal. There has been a series of intelligence fiascos surrounding: China's attack on India in 1962; India's failure to predict Pakistan's reactions to the 1986 Brasstacks exercise; widespread problems during the 1999 Kargil crisis;⁶³ and the capture and murder of Indian border guards by Bangladesh's border forces in April 2001. As Kanti Bajpai observed, "the organizational competence of both Indian and Pakistani intelligence leaves something to be

desired... [Adding the NW element now] raises totally new problems of intelligence gathering and assessment for both sides."⁶⁴

Also doubtful is whether either country has the means to adequately detect an impending attack (whether by aircraft or missile) and then post an effective defense. While India and Pakistan have radar systems to track incoming enemy aircraft (currently the most likely means of weapons delivery),⁶⁵ it is questionable how effectively each country would defend against a low-level attack.⁶⁶ Questions remain with regard to what degree their air defense command and control networks could make accurate assessments in time to alert senior leaders, and air defense forces. Even worse, neither country has the ability to detect or track missile launches (the preferable—and high development priority—means of weapons delivery).⁶⁷ The first indication that a nuclear attack was underway would be the explosions taking place overhead. Until New Delhi and Islamabad obtain adequate strategic warning capabilities and support, they might be tempted to launch preemptively or at least upon questionable warning.⁶⁸

Opaque Nuclear-Critical Information Flow Systems

An area shrouded in deep mystery is both countries' systems of nuclear-critical information flow, which ideally should be designed to feed intelligence and operational reports to the senior leadership, who then pass decisions down to the NW operators. Obviously, concern over exposing a weak link or critical node in the process sharply limits any public discussion by either country.⁶⁹ Discussions about what India actually possesses have been limited to academics and retired military men; limited discussions of Pakistan's systems were only recently forced, because of fears that Pakistan had or would soon lose control over its warheads and radioactive materials. However, based upon the assumption that new nuclear states like India and Pakistan face greater fiscal, technological, and institutional barriers to creating a robust C2 system, many experts are pessimistic. Scott Sagan concluded that such arsenals will be "considerably less safe than those of current nuclear powers... Some emergent nuclear powers... may not be able to afford even a modicum of mechanical safety devices and modern warning sensors and will therefore be more prone to accidents and false warnings."⁷⁰ Here the United States must also include mechanisms to inform decisionmakers as to the security and accountability of nuclear materials and warheads.

However, at least according to many Indian commentators, the preference is to establish a small, limited C2 system, based less on objective fixed requirements linked with nuclear deterrence and warfighting and more on cost concerns. It is of deep concern that much of the Indian counter-debate in support of a far simpler C2 system focuses on the cost aspect instead of what would actually be required to ensure effectiveness.⁷¹ Arguments, such as that of Prime Minister Vajpayee, that “since India’s nuclear doctrine is different from that of the (other) nuclear powers, India does not need to replicate their command and control structures”⁷² are common. While an elaborate information network might not be necessary to help preclude unauthorized weapons transfers, a simplistic C2 system will be unable to handle the extreme demands potentially placed on India’s proclaimed “no first use/ride out attack” strategy. In such a strategy, the C2-related stresses of assembling authorized political leadership, determining which forces have survived the attack, assessing whether an adversary has any remaining nuclear forces, deciding upon the appropriate targets, and communicating the decision to strike—all amidst the wreck of a nuclear catastrophe—are quite significant. Furthermore, it is necessary to stress that smaller nuclear arsenals do not automatically translate into a respectively smaller C2 apparatus; in addition to several inherent “sunk” costs (e.g., underground bunkers for senior political leaders and nuclear control nodes), the very vulnerability of a limited nuclear force to a crippling strike may well require a proportionally higher degree of C2 connectivity.⁷³

As mentioned earlier, what nuclear C2 Pakistan actually has or desires to acquire has until recently been a matter of pure speculation, since there was very little information available in the open literature. Perhaps Pakistan was a prime example of what Peter Feaver had in mind when he admitted that

[r]eliable data on existing or developing systems of command and control in emerging nuclear nations are scarce... Command and control has one unavoidable drawback as a level of analysis: there is virtually no reliable information available about command and control in proliferating countries... Credible information on the current situation in proliferating countries, many of which seek to hide the very existence of their nuclear programs, is [extremely] scarce.⁷⁴

Only concerns over the safety of the Pakistani nuclear arsenal, raised in light of possible domestic extremist sup-

port for the al-Qa’ida terrorist organization, prompted Islamabad to make more detailed explanations of its command and control apparatus. According to the description given, Pakistani nuclear C2 includes: a Strategic Force Command for each of the three armed services; the enforcement of clear chains of responsibility; and the enactment of “stringent measures to minimize risks of accidental, unintentional or unauthorized launch.”⁷⁵ This general description leaves many questions about the adequacy of Islamabad’s C2 structure unanswered.

However, if Feaver’s theoretical analysis of the role of civil-military relations in determining the type of nuclear C2 (assertive or delegative) holds true, there is at least some hope that the Pakistani military government has enforced strict assertive (fail-safe) control over the country’s nuclear arsenal.⁷⁶ Others like Gregory Giles are not sanguine, though, pointing to the country’s lack of strategic depth lending to a more delegative (fail-deadly) form of nuclear C2.⁷⁷ In either case, while conventionally outmatched Pakistan could promote the image that it is more nuclear “trigger happy” vis-à-vis India, it is doubtful that it would really play nuclear Russian roulette, given the severity of the potential consequences. Its optimal strategy would be to ensure centralized C2 of its nuclear arsenal, while bluffing India that a Pakistani juggernaut could be easily unleashed. The key here is that the Pakistani nuclear C2 system—by deliberate design or deliberate disinformation—may well leave a lot to be desired. Certainly, one can assume that if relatively well-off India hesitates before investing in an extensive C2 system, cash-strapped Pakistan would be even more constrained.

The debate surrounding the necessary information flow requirements for small nuclear arsenals needs much more objective analysis.⁷⁸ For the moment, however, one suspects that India and Pakistan will aim for low-cost C2 systems and/or consider it a low priority among many more pressing items. However, building a C2 system “on the cheap” is short-sighted and may have disastrous consequences. Again, while it may be sufficient to preclude theft, trying to solve an inherently complex problem cheaply lends itself to failure. In this case, it will likely result in a C2 system that deploys mated weapons to the field and dangerously pre-delegates launch authority to lower levels than conditions might warrant. In short, opting for the positive/delegative control option instead of the preferred negative/assertive alternative might make budgetary sense, but at the cost of strategic bankruptcy. The dangers of an unauthorized nuclear exchange would then grow exponentially.

Uncertain Status of Decisionmaking Processes and Nuclear Control System Exercises

In both India and Pakistan, there is a mixed record with regard to the elements that support and in turn are supported by nuclear C2: the decisionmaking process and exercises of the nuclear control system. India has moved far ahead of Pakistan. Despite some murmuring by the military that it should play a larger role in nuclear issues, India enjoys solid and professional civil-military relations. India clearly places national NW command authority under the prime minister and minister of defense; delivery systems are controlled by the military, while control of the warheads is under civilian laboratories.⁷⁹ Still, New Delhi is wrestling with delineating succession of nuclear decision authority in the event that the prime minister is incapacitated. Additionally, reforms in the Indian defense establishment, such as placing administrative control of the strategic nuclear forces under the chief of the defense staff and the creation of a strategic command, continue to be fiercely resisted by the Indian Air Force.⁸⁰

Conversely, Pakistan—given its “jihad culture”⁸¹ and the very real potential for internal collapse⁸²—suffers from historically poor civil-military relations. This reality has not only dangerously weakened various domestic institutions,⁸³ but also poses problems for the leadership in charge of the nuclear arsenal. While Pakistani officials have stated that there is now a national command authority, one senses that the senior military leadership—perhaps well-respected and effective, but still hawkish, unelected, and unaccountable to the people—will retain the major role in deciding when to press the nuclear button, even if martial law is eventually lifted.⁸⁴ The key is that no one in the West, in India, or perhaps even in Pakistan itself knows who the ultimate decisionmaker is in Islamabad’s nuclear affairs. The worst time to resolve this issue is when internal or external tensions increase, and the potential for conflict increases dramatically. President Musharraf may have won a short-term victory in defusing popular support of the Taliban, restraining fundamentalist clerics, corraling the rogue Inter-Services Intelligence Agency, arresting and banning radical Islamic militants inside Pakistan and Kashmir, and retiring or reshuffling senior military critics.⁸⁵ He has only just begun the laudable but, nevertheless, lengthy process of reshaping Pakistan into a “progressive and dynamic Islamic welfare state.”⁸⁶ Yet the potential for future serious challenges to his control of the country and, by default, its nuclear arsenal has not been eliminated. The next coup leader—and one suspects

there are several serious contenders currently waiting in the wings—might not be as favorably disposed to the United States or as capable or willing to deny support to terrorist groups.

Turning to the issue of nuclear C2 exercises, an unclassified paper would not be the venue to analyze any foreign exercises, if indeed any have taken place. To date, there is no open source reporting on the topic. Still, there is a solid argument for the periodic and publicly pre-announced systemic testing of one’s nuclear C2. Nuclear command exercises can work out problem areas before any NW are operationally deployed. Command post exercises performed when tensions are relatively low can provide reassurance—both at home and abroad—that there is strict control and accountability of nuclear forces.

Using either press releases or controlled leaks (e.g., through double agents, anonymous officials, etc.), results of such exercises can convince an adversary of one’s ability to steer the nuclear juggernaut, thus reinforcing deterrence. For example, if Pakistan can no longer assuage India by keeping its weapons unassembled, then there is some value in demonstrating to leaders in New Delhi (and Washington) that Pakistani negative/assertive nuclear C2 mechanisms are functioning. The knowledge of an effective nuclear C2 system would indicate to India that the possibility of accidental and inadvertent weapons release is low. In addition, such information could reassure Indian leadership that there is a steady hand at the nuclear helm in Pakistan. Internationally, it would provide confidence to the United States and other states that rogue elements were unlikely to seize control of the state’s NW and pass them to a third party. The same arguments hold true for India, given that it also faces internal separatist movements and unresolved borders;⁸⁷ India also suffered from martial law and the suspension of its constitutional processes during Indira Gandhi’s tenure.

U.S. ASSISTANCE TO SOUTH ASIAN NUCLEAR C2

To what degree should the United States provide India and Pakistan with assistance to develop negative/assertive (centralized control) C2? Ultimately, the decisions concerning what C2 elements to share hinges on two issues: (1) will the system guard against the possibility of an accidental, inadvertent, or unauthorized detonation or transfer of a nuclear weapon; and (2) will the system also significantly enhance the capability to engage in a nuclear warfighting rather than simply a deterrence-only posture?

In some cases, the situation may be easy to assess, but in many others there is a great deal of uncertainty.

ADVANCING NUCLEAR SAFETY AND SECURITY

As argued earlier in this viewpoint, it appears that neither India nor Pakistan currently has adequate safeguards in place. The provision of various safety and security safeguard technologies would greatly reduce the risk of a nuclear weapon being stolen, launched by an unauthorized person, or detonated accidentally on one's own territory. Such improvements do nothing to improve the effectiveness (e.g., probability of launch, probability of arrival, probability and size of detonation) of the weapon and should be acceptable under current arms control agreements.

In a series of candid, off-the-record bilateral talks, the United States could brief India and Pakistan in full on the details of American procedural (e.g., proper handling, storage, transport, training, education, two man rules, etc.) and personnel (e.g., the Personnel Reliability Program) nuclear safety measures. The next step would be to discuss and demonstrate at facilities in the United States the various types of physical safety measures for NW storage sites. If needed, the U.S. government could also establish a Nunn-Lugar type arrangement for improving South Asian NW storage and transport, such as providing sensors, alarms, tamper-indicating seals, armored rail cars, and polygraph testing of NW security personnel. This last step would be especially pertinent to the personnel problems currently faced by Pakistan.⁸⁸ Apparently, the Bush administration, in a marked departure from previous U.S. policy, has offered Pakistan assistance in improving the security of its nuclear arsenal—while trying not to inadvertently improve the the reliability or accuracy of Pakistani nuclear weapons.⁸⁹

A more controversial step would have the United States provide both countries with NW design information to enhance weapons safety and security (e.g., component separation, one-point safety, environmental sensing devices, permissive action links, fire resistant pits, insensitive high explosive, enhanced nuclear detonation safety system, etc.).⁹⁰ This type of assistance, of course, would be conditional on not improving weapons yield or delivery accuracy. When South Asian and nuclear experts write about or discuss sharing nuclear C2 systems, they suggest this option most often, if at times reluctantly and usu-

ally with only a vague definition (when one is given) of what C2 actually encompasses.⁹¹

Some NW design material might already be declassified; however, there are several reasons why the bulk of the information shared with India and Pakistan should remain highly classified even if released to them. First, maintaining a high standard of classification serves as a caution to the South Asian states not to release the information or technology any further, with the aim of keeping it out of the hands of other nuclear proliferators. Second, both countries will be aware that they are receiving the same information and not getting a leg up on the competition as a result of U.S. assistance. Third, it shows the trust and high level of concern with which the United States holds its counterparts in the Indian and Pakistani nuclear and military organizations. Security classifications “can be very easily adjusted downward if the U.S. wishes to share that information with another... [and in fact] the upper limit of what is released to another nation represents the amount of trust.”⁹² As will be discussed later, the trust issue is the most vital element in the equation. The option of passing only unclassified data, as some have suggested,⁹³ is not only bureaucratically narrow-minded but quickly implies there is a low level of trust between the United States and the country in question. Opting to declassify data prior to releasing it, as others have recommended,⁹⁴ has the undesired effect of a consequence free and unwanted release to other potential nuclear weapon states. Rather, agreements such as the recently signed U.S.-India Bilateral General Security of Military Information Agreement may well serve as ideal vehicles for the secure transfer of classified NW technology.⁹⁵

If there is still some unease about releasing too much data and technology too soon, the United States could at least pass along earlier versions of its PAL and other weapons security designs. Officials could first broach the subject and associated details very discretely or through semi-official channels. There seems to be some interest by Pakistan in obtaining such safeguard technology from the United States, judging by the fact that they mentioned the topic to an U.S. Air War College delegation in March 2001.⁹⁶ Perhaps India's interest has now been piqued as well, since it is common knowledge that the United States has been formally engaging Pakistan on this matter.

Improving Intelligence and Early Warning Networks

Within this category of intelligence and early warning networks, the United States must be selective in what should and should not be shared with India and Pakistan. It would appear prudent to provide both countries with a regular flow of selected data about each other as a means of confidence-building. Of course, the United States would have to work to maintain the trust of both countries at the same time. This goal could be partly accomplished through the provision of early warning networks—technical means that are inherently impartial.

Deeply discounted U.S. sales of early warning radar systems and associated air defense C2 networks would provide leaders in New Delhi and Islamabad with more accurate assessments of the nature and likely target of any ingressing aircraft.⁹⁷ Another method would be the continuous provision of missile launch data to buttress the Indo-Pakistani bilateral agreement on missile test notifications. The early warning data sharing agreement signed between the United States and Russia serves as a good example.⁹⁸ Ironically, the data flowing to both countries around the clock would largely show that no launch activity was underway; in other words, no news is good news, and thus tensions and distrust would lessen considerably.

A more pedestrian level of support could include the provision of warning data and/or surveillance systems to track potential ground border incursions in the volatile Kashmir region.⁹⁹ As a further step towards strategic stability, both countries should enter into agreements to abstain from attacking each other's warning and surveillance networks, since each has an interest in protecting, if not outright assisting "[the other's] warning system's ability to demonstrate that an attack is *not* in progress...explicit arrangements should be made for mutual protection of these assets."¹⁰⁰

U.S. provision of intelligence can also prove beneficial. For example, it appears reasonable to provide India and Pakistan regular satellite and on-site surveillance of key air and military bases of the other where missiles or nuclear-armed aircraft might be deployed.¹⁰¹ Certainly such information would lessen the tendency to misinterpret data or act on incomplete data and worst-case assumptions. This measure would be an important and far more dynamic addition to the annual exchange of lists of nuclear installations between India and Pakistan.¹⁰² More-

over, intelligence sharing is an area in which both India and Pakistan have expressed interest, and probably assume U.S. support in times of crisis.¹⁰³ If anything, it would restore the intelligence balance between the two states, given the one-meter resolution satellite imagery India can now provide for itself,¹⁰⁴ which Pakistan is ill-equipped to afford on its own. Barring the unlikely agreement by either country to permit neutral observers (or an Open Skies-style arrangement) on or near its nuclear-capable bases, the only option is satellite surveillance—where the United States has a clear advantage. A question, of course, is not only whether the United States should pass along that information, but also whether it even knows where Indian and Pakistani NW storage sites are located.¹⁰⁵

To be sure, this proposal is not without its problems. Some measures meant to improve intelligence shortfalls will also improve the capability of each state to engage in a deliberate nuclear exchange. For example, the United States should take great care with regard to the imagery of what bases and areas are given to either country, the quality of that imagery, and its timeliness. The U.S. government should not be a blithe and impartial provider of intelligence to India and Pakistan. At times it would be necessary to selectively release information, in an effort to keep tensions from boiling over. Not all imagery intelligence support will automatically enhance stability. For example, if either country chooses mobility or concealment and deception measures to provide a degree of survivability to its nuclear force, the United States must not reveal that force's whereabouts to the other country. In doing so, though, the United States may inadvertently relinquish its impartiality and become part of the problem, rather than part of a solution to enhance security.

Additionally, care would have to be taken to not reveal too much about the methods and capabilities of U.S. collection systems, since this information can and has been turned against the United States.¹⁰⁶ Moreover, it may be politically difficult for India and Pakistan to share information about possible terrorist or criminal attempts to steal a nuclear warhead.

Perhaps greater mileage would be obtained by engaging the Indian and Pakistani military intelligence services in a training program to improve the quality of their analysis. The goal here would be to foster a more professional, less adversarial, politicized, or biased relationship with their own policymakers. Resuming an equal participation by both countries in the U.S. International Military Educa-

tion and Training program might prove useful in this regard.

Cultivating Nuclear-Critical Information Flow

The dilemma over what information to share without unduly strengthening Indian and Pakistani capability to commence a nuclear exchange becomes almost unsolvable. As noted earlier, neither country appears to have a reliable system to disseminate readiness data and communicate operational decisions to and from their nuclear arsenals. Nonetheless, simple improvements to their C2 structures to at least ensure complete accountability and improve nuclear warhead safety would reassure South Asian and other state leaders. However, before the United States becomes too ambitious in this regard, it must be stressed that any significant C2 system serves both deterrent and warfighting functions. Short of abandoning the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) entirely, the United States cannot provide support for one function without supporting the other. At most, it can engage both countries in candid discussions of C2 theory (e.g., concepts, doctrine, procedures, and organizations). The United States can also emphasize its concerns about the risks of deploying weapons before a robust C2 system is in place and make a case for a more stabilizing negative/assertive information flow network. The provision of any advanced nuclear-critical information systems or technologies is too problematic and politically explosive.

Establishing Command Authority and Control Exercises

Finally, there is the issue of national command authority and nuclear command and control exercises. Rather than deny India and Pakistan *de facto* nuclear status, the United States should openly engage them on these critical issues, one fellow nuclear state to another. Such a policy would not imply that the U.S. government necessarily welcomes their nuclearization, but shows that it is not ignoring reality and hoping it will go away. India and Pakistan should be engaged as soon as possible in bilateral, candid, and non-judgmental dialogue with the United States to address the important role of constitutionally legitimized authorities to maintain vigilant watch over their nuclear arsenal. The purpose is not to cast aspersion on their domestic political situations, but rather to stress the need for a clear, consistent, and preferably civilian-led nuclear chain of command. The U.S. government should outline its own

rationale and methodology of exercises to test the system and involve those political authorities. In addition to official and unofficial discussions, there would be great benefit in inviting India and Pakistan to witness U.S. exercises of the safety and security systems at its warhead storage areas, deployed weapons sites, and its major strategic command posts. Unlike all the other C2-related issues above, here there may be some benefit in a multilateral exchange, involving India and Pakistan simultaneously.

OBSTACLES TO SHARING NUCLEAR C2

The full provision of nuclear C2 would not solve all the tensions in South Asia, but simply acts as a significant brake for crisis management now that India and Pakistan have become nuclear powers. Sharing C2 would most certainly not be an easy effort. Even if one accepts that a negative/assertive C2 system provided by the United States would help India and Pakistan achieve nuclear crisis stability, there are significant obstacles in taking such a radical move.

In the first place, despite ongoing efforts by the United States to improve relations with both countries, India and/or Pakistan might not accept U.S. assistance. Pakistan has been an on-again, off-again ally of the United States, a country that is seen by Pakistanis themselves as suffering from a "pattern of shifting alliances, short memories and a pronounced tendency to forget its friends when it tires of them."¹⁰⁷ While India welcomes a closer relationship with the sole remaining superpower, it is adverse to any restrictions on its NW program. Both countries display little trust of the United States with regard to nuclear matters, given the history of U.S. opposition to their nuclear programs. Allegedly, they already once rebuffed U.S. offers of nuclear C2 assistance, arguing that there were too many preconditions attached (e.g., pledges not to deploy NW).¹⁰⁸ They may show a deep resistance to any form of negative safeguards technology (particularly weapons safety), for fear it might give the United States some form of veto control over their weapons.¹⁰⁹ They may also fear U.S. assistance as being a convenient cover for espionage or even sabotage against their nuclear arsenals.¹¹⁰ Offers of technical assistance to Pakistan's NW program,¹¹¹ such as the recent one made by U.S. Secretary of State Colin Powell, may not always be accepted at face value and may even be perceived as Western condescension.¹¹² Additionally, the United States may be faced with countries that are simply not interested in adopting mini-U.S. style nuclear safeguards arrangements but instead feel, as did

Indian Prime Minister Vajpayee, that they do “not need to replicate [U.S.] command and control structures.”¹¹³

Developing trust and convincing India and Pakistan that there are significant C2 shortfalls in their nuclear arsenals are very important preliminary steps. To start, the United States should initiate candid and off the record bilateral talks with South Asian counterparts in the military and government weapons labs.¹¹⁴ U.S. academics known to have the ear of senior policymakers and who specialize in nuclear C2 issues could be useful if official/semi-official contacts are hard to start. Certainly the candor of senior South Asian officials regarding their own deficiencies in intelligence and missile warning, as well as their subtle suggestions for U.S. support in the former arena, offer an initial opportunity to begin nuclear C2 dialogue. From that point, U.S. nuclear experts can discuss frankly the rationale for our nuclear safeguard/C2 technologies and procedures, explain the various tests of these systems, demonstrate, and eventually share specific weapons safeguard systems and/or designs. In this manner, India and Pakistan would be more likely to gradually trust U.S. intentions and begin measures to field comprehensive nuclear C2.

Assuming the United States can convince India and Pakistan of its sincerity, dependability, and even-handedness¹¹⁵ in providing nuclear C2, there are many national and international constraints—legal or otherwise—on such assistance. Various U.S. domestic laws (e.g., the 1954 Atomic Energy Act) and international treaties (e.g., Article 1 of the NPT) impose serious restraints against any NW assistance. However, the legal hurdles to such assistance might not be as high as they would appear.¹¹⁶ In some cases, while the NPT must be interpreted in good faith in accordance with the ordinary meaning given to its terms,¹¹⁷ a presidential decision to determine the interpretation of the treaty’s strictures may not violate its legislative intent (i.e., the spirit versus the letter of the law). According to one study, “as long as proposed nuclear assistance does not contribute to the building of a new weapon or an increase in the destructive ability of existing weapons, and [will] make existing weapons more safe and secure, assistance does not appear to violate the legislative intent of the Arms Control and Non-Proliferation Act of 1994.”¹¹⁸

Additionally, the provision of negative/assertive nuclear C2 supports the broader goals stated in the NPT preamble: “to make every effort to avert the danger of [nuclear] war and to take measures to safeguard the security of

peoples.”¹¹⁹ Of note, international law defines a treaty agreement to include, in addition to the main text, preambles and annexes. Thus, a case could be made that selected assistance is within NPT strictures (as long as the general wording of the preamble does not violate specific prohibitions in the treaty articles themselves). This potentially guarded approval of a more restrictive provision of nuclear C2 affects what types of assistance the United States could permissibly share, but it may not necessarily prevent some form of C2 assistance. U.S. laws and international treaties may act as speed bumps and not road blocks to such support.¹²⁰ If need be, the NPT might be “restructured to allow for international cooperation in nuclear safety technology.”¹²¹ Notably, during the Clinton administration the legal reading was that this recommended assistance, however well-intentioned, was barred by the NPT. As late as October 2001, Bush administration officials had yet to make a final determination regarding the legality of strengthening Pakistan’s nuclear C2 structure within the NPT restrictions.¹²² However, apparently by late November 2001, the Bush administration appeared to have resolved the legal hurdles in assisting a non-NPT signatory’s nuclear C2.¹²³

Still, given Indian and Pakistani predilection for risky behavior (whether or not it has been made worse by their nuclear arsenals), some have argued that the provision of nuclear C2 only encourages them to assemble and deploy their weapons. According to this reasoning, the current lack of safety and security safeguards acts as a self-deterrent to deployment. The leaders of India and Pakistan, no matter the tension between their states, are rational decisionmakers and are not likely to make deliberate attempts to initiate nuclear conflict. By this argument, the U.S. provision of safeguards could be self-defeating and potentially lead to a situation more dangerous than if nothing had been done in the first place.¹²⁴ This is a serious challenge and caution against any assistance whatsoever; in the short-term, it certainly raises the possibility that the weapons would be operationally deployed at all times versus being relatively safe unmated and non-deployed. The nonproliferationist creed of “do no harm” would be violated.

Nevertheless, as has been discussed earlier, even unassembled warheads require some degree of C2 to ensure their accountability, safety, and security. Additionally, the lack of adequate C2 has not deterred India and Pakistan from already deploying these weapons during times of great crisis (e.g., Pakistan in 1990, India and

Pakistan in 2001 and 2002). Neither country can turn back time and return to a relatively safe default position like South Africa (weapons undeclared/unassembled) or Israel (weapons undeclared but suspected/usually unassembled). A strong and objective intelligence apparatus and a smoothly functioning decisionmaking process will always be needed. Once a state develops NW, nuclear C2 must soon follow.—but it appears that neither India nor Pakistan is adequately prepared for what they have created.

It is not without some reluctance that this policy recommendation is made, but without it as a solid option, one ends up “doing no good.” A balance between costs and benefits must be struck between the lesser of two unpleasant alternatives. The oft-used metaphor in this case is that of teenagers and condoms: “one prefers that it not happen, but if it goes on anyway, there are strong incentives for assuring that it happen safely.”¹²⁵ On a more pessimistic note, one could also compare providing nuclear C2 safeguards to handing out clean needles to drug addicts in order to prevent AIDS: accepting a lesser social evil to avoid one more disastrous.¹²⁶ In short, “other things being equal, no proliferation is preferable to safe proliferation, but in any event, safe is better than unsafe proliferation.”¹²⁷

The final obstacle lies in whether “managed proliferation” will weaken the international taboo against nuclear proliferation, raising fears that such “neo-non-proliferation negativism” will in the end “erode one of the most important pillars of American foreign policy.”¹²⁸ Others echo the fears of Leonard Spector that *any* assistance whatsoever to a new nuclear state would only encourage others to take the same path.¹²⁹ Certainly the NPT has taken a great deal of damage recently, from non-compliance by Iraq and North Korea, the continued relevance of NW in U.S. and Russian defense planning, and the lifting of U.S. sanctions against South Asia. However, given the deep-seated reasons behind Indian and Pakistani decision to develop NW, why would U.S. reluctant acceptance of the nuclear *fait accompli* in South Asia incite another state to begin the onerous decades-long process of developing NW? It too would have to weigh the costs versus benefits of nuclear proliferation. It is not axiomatic that U.S. recognition of the obvious in South Asia “will inevitably shred the carefully woven fabric of the global nonproliferation regime.”¹³⁰ The nuclear taboo should remain if the United States portrays India and Pakistan as the exceptions to be begrudgingly accepted—if

uninvited—into the nuclear club, neither emulated nor made to suffer the criticisms of a “nagging nanny.”¹³¹ For example, India should not move to the front running for a potential sixth permanent UN Security Council seat solely by virtue of its nuclear prowess (and certainly not by its intransigence on the Kashmir issue). Such a “reward” should go to those who eschew (Japan) or abandoned (Brazil, South Africa, Ukraine) NW.

On a more pragmatic level, consider the alternatives: what arms control options vis-à-vis South Asia would a pure nonproliferationist give a policymaker faced with the current conditions? Some options (e.g., mediation, persuasion, unilateral security guarantees, multilateral security guarantees, economic assistance, ending aid, political and economic sanctions, and preemptive military strikes) may have been considered. The different options that have been tried might have slowed down the process, but they have failed to halt much less rollback proliferation in South Asia. Current circumstances have gained the United States success in convincing Pakistan to make bold steps vis-à-vis its Kashmir policy—for Islamabad a core issue as important if not more important than NW. But time will tell whether this policy change and our current pressures will continue successfully for the long haul. The current circumstances, in fact, raise the suspicion that a sustained effort to successfully convince or pressure India and Pakistan to at least de-weaponize, if not de-nuclearize, is not in the offing. The international opprobrium and sanctions heaped on India and Pakistan following their 1998 nuclear tests was relatively short-lived. It is highly questionable whether the United States would challenge its new-found allies.

Absent firm international support to restore sanctions and other punitive measures (even if they were to actually prove effective), would a principled opposition to any assistance do anything to reduce the potential inadvertent or accidental nuclear exchange in South Asia? What other options are there to reduce the very real risk of stolen radioactive materials and nuclear warheads? At most, staying the course would give United States the cold comfort to say “I told you so” following a nuclear exchange. Even critics of U.S. recognition of South Asian *de facto* nuclear weapon state status have admitted there is little that can be done to change the course of India and Pakistan’s decisions.¹³²

In short, there seem to be few good options when faced with states that have already developed, declared, and deployed NW. The United States cannot proceed ostrich-

like, hoping that India and Pakistan will wean themselves away from an addiction to NW—especially when the United States itself is “hooked.” Instead, there is a need to make the most of a bad situation and come up with another approach, one more nuanced and differentiated to unique circumstances. In essence, the United States must decide whether to condemn, strike, or assist. The first option was tried but failed; the second may have been considered but is far too risky; so the third remains. As Gregory Giles writes, “for all the risks raised by assistance on nuclear weapons safety and security, the dangers of inaction by the international community are even greater... Where rollback is a less realistic expectation, safety and security assistance should take a more active role.”¹³³

Sharing selected aspects of nuclear C2 to achieve a negative/assertive system is a viable and promising option, if one reluctantly taken. This reality is reflected in a comment by Secretary of Defense Donald Rumsfeld in a CNN interview: that the United States should “be helpful to both India and Pakistan, to see that they develop the kind of capabilities, management, controls and confidence-building measures and warning systems and understandings” so that the chance of a nuclear exchange “is lowered to a point that it’s near zero.”¹³⁴

CONCLUSION

The United States should transfer—free of charge—*selected* systems, procedures, and technologies to *both* India and Pakistan in order to create a “fail-safe” negative/assertive nuclear C2 apparatus in both states. The purpose of this transfer would be to ensure strict control of their arsenals and reduce the chance of theft or diversion of a nuclear weapon as well as the risk of an inadvertent or accidental launch, or a launch on warning posture. The ultimate goal would be to give both countries a strategic pause to establish arms control agreements and CBMs. India and Pakistan need “time” and “distance” to back away from the nuclear precipice. South Asia aside, the United States must obtain the reassurance that Pakistani and Indian NW will not be used against the United States by third parties. There are very few alternative options available.

This policy is only one step towards avoiding a nuclear exchange on the sub-continent. The preferred approach should still be to dissuade India and Pakistan from operationalizing and deploying their NW. “Roll-back to zero” will remain a distant, laudable, but perhaps unat-

tainable goal. But when the inevitable permanent deployment of NW occurs, Pakistan and India—as well as the United States—will have some protection via comprehensive nuclear C2. Since India and Pakistan cannot put the nuclear genie back in the bottle, they must master what they unleashed. The United States must do what it can to help this process. To only hector South Asia on the dangers of NW is fruitless and effectively turns a blind eye to friendly nations in need, whether or not they would like to admit it. To accomplish nothing more substantial than criticism and ineffectual sanctions increases the risk for U.S. security as well.

There are no panaceas recommended here, just practicable solutions to begin to untangle thorny problems. As the countries concerned implement these measures, they and the United States must realize that these C2 solutions are only stop-gap measures. They can be bypassed,¹³⁵ can fail,¹³⁶ are only as robust as the societies in which they are imbedded,¹³⁷ and could lead national leadership to be over-confident in its (and its adversary’s) ability to control the nuclear juggernaut.¹³⁸ Given these dangers, India and Pakistan should make serious overtures to reducing tensions, building trust, and resolving core disputes. They must implement realistic and verifiable CBMs and agree to a ban on further nuclear and missile tests. Cease-fires and military withdrawals should be implemented in good faith along the Line of Control,¹³⁹ with sincere multilateral negotiations to cut the self-created/self-tightening nooses around their necks.

Most importantly, India and Pakistan must move forward to: abandon their all-or-nothing positions vis-à-vis Kashmir; no longer identify Kashmir with their core and mutually exclusive identities;¹⁴⁰ recognize the crushing costs that the maintenance of large militaries have had on their social infrastructures; stop supporting foreign *jihād* guerrillas (Pakistan); stop human rights abuses by their security forces against Kashmiris (India); and accept that the Kashmir issue is neither an internal nor a bilateral issue but an international problem (India). New Delhi and Islamabad must move beyond the collapse of the July 2001 summit in Agra, not misuse such opportunities as the South Asian Association for Regional Cooperation summit in Nepal in January 2002, and succeed in engaging in genuine conciliatory gestures, as it appears India is currently doing with Pakistan vis-à-vis Kashmir.¹⁴¹

For its part, the five permanent members of the UN Security Council must aggressively lead an impartial effort to break the impasse over the Kashmir issue, “the

root cause of insecurity and instability in South Asia.”¹⁴² This effort should not be made in a quixotic attempt to denuclearize India and Pakistan. Rather, it is meant to undo and reverse the intense hostility that is warping their bilateral relations and threatening a substantial portion of humanity. UN involvement—and U.S. mediation (rejected for now by Secretary of State Powell)¹⁴³—can provide top cover vis-à-vis the domestic political outcry resulting from a compromise solution,¹⁴⁴ whether international protectorate, independence, partition, or union. Any lasting solution in Kashmir must factor in the desires of those most liable to be caught under the wheels of a nuclear juggernaut: the Kashmiris themselves. In the end, all—the United States, India, and Pakistan—must have the wisdom to discover the truth, the courage to choose it, and the strength to prevail.

¹ Andrew Koch, “India, Pakistan: Nuclear Arms Race Gets Off to a Slow Start,” *Jane’s Intelligence Review* 13 (January 2001), pp. 36-40.

² Another likely source of radiological materials could be the Newly Independent States, routed through Central Asia or the Caucasus by organized criminal groups. See Steven Erlanger, “Lax Nuclear Security in Russia Cited as Way for bin Laden to Get Arms,” *New York Times*, November 12, 2001, p. B1.

³ See Jeanne Whalen, “Uranium Bust Heightens Fears about Russia’s Nuclear Materials,” *Wall Street Journal*, December 10, 2001, p. A13; Bob Woodward et al., “U.S. Fears bin Laden Gain in Nuclear Effort,” *Washington Post*, December 4, 2001, p. 1; David E. Kaplan and Douglas Pasternak, “Terror’s Dirty Secret,” *U.S. News and World Report*, December 3, 2001, p. 26, and, John Emshwiller et al., “Suddenly Small Gaps in Nuclear Security Are Starting to Look More Like Chasms,” *Wall Street Journal*, October 17, 2001, p. A1.

⁴ There have been growing concerns over the potential of the proliferation of nuclear weapons (NW) and associated delivery systems from Pakistan to North Korea. See Andrew Koch, “USA Fears ‘Secondary’ WMD Proliferation,” *Jane’s Defence Weekly*, September 5, 2001, p. 6.

⁵ Shireen M. Mazari, “Comment: Nuclear Safety vs. Nonproliferation,” *Strategic Studies* 20 (Autumn 2000), p. 6.

⁶ For example, on whether India exploded a thermonuclear device, see T. S. Gopi Rethinoraj, “Indian Blasts Surprise the World, but Leave Fresh Doubts,” *Jane’s Intelligence Review* 10 (July 1998), p. 20; and R. Jeffrey Smith, “Analysts Skeptical of Pakistan’s Claims,” *Washington Post*, May 29, 1998, p. 33. Criticisms of the series of Pakistani tests may be found in Rethinoraj, “Indian Blasts Surprise the World,” p. 21; and, W. P. S. Sidhu, “High Price Expected for Pakistan’s One-upmanship,” *Jane’s Intelligence Review* 10 (July 1998), pp. 28-29.

⁷ A variety of circumstances seemingly forced Pakistan at least to show its hand regarding the operational status of its small nuclear arsenal. In June 2001, Lt. Gen. Beg, a former head of Pakistan’s military, stated that Pakistan’s 30 or so NW were normally disassembled at a site “many miles away” from the delivery systems. See John F. Burns, “Pakistan: Nuclear Secrets,” *New York Times*, 27 June 2001, p. A9. The recent operations in Afghanistan forced Islamabad to reiterate this stand with “most of its nuclear devices...kept in component parts, not as assembled warheads.” Furthermore, in light of tensions within Pakistan itself, “separately stored uranium and plutonium cores and their detonation assemblies were moved [on October 7, 2001] to six new secret locations around the country.” See Mansoor Ijaz and R. James Woolsey, “How Secure is Pakistan’s Plutonium,” *New York Times*, November 28, 2001, p. A25. However, as discussed in the main text, eventually some of these components were mated with delivery vehicles.

⁸ For example, see Amit Gupta, “India’s Draft Nuclear Doctrine,” *Round Table* (July 2000), p. 363; Pratas Bhamu Mehta, “India: The Nuclear Politics of Self-Esteem,” *Current History* 97 (December 1998), p. 405; Francois Heisbourg, “The Prospects for Nuclear Stability between India and Pakistan,” *Survival* 40 (Winter 1998-1999), pp. 80-81; Amit Gupta, “South Asian Nuclear Choices: What Type of Force Structures May Emerge?,” *Armed Forces Journal International* (September 1998), pp. 26-27; Maroof Raza, “Nuclear India’s Doctrine of Deterrence,” *Indian Defence Review* 14 (July-September 1999), p. 37; and, W. P. S. Sidhu, “Pakistan Puts Its Nuclear Cards on the Table,” *Jane’s Intelligence Review* 10 (July 1998), p. 26.

⁹ See P. R. Chari, “India’s Nuclear Doctrine: Confused Ambitions,” *Nonproliferation Review* 7 (Fall-Winter 2000), p. 123; Tehmina Mahmood, “India and Pakistan’s Nuclear Explosions: An Analysis,” *Pakistan Horizon* 52 (January 1999), pp. 42-43; and, Sumit Ganguly, “Explaining Indian Nuclear Policy,” book review, *Current History* 98 (December 1999), p. 438.

¹⁰ Gaurav Kampani, “Living with India’s Bomb: In Praise of Indifference,” p. 21, <<http://cns.mii.edu/pubs/other/indbomb.htm>>.

¹¹ Other commentaries on the motivation behind India’s NW program include Jaswant Singh, “Against Nuclear Apartheid,” *Foreign Affairs* 77 (September-October 1998), pp. 49; Sumit Ganguly, “India’s Pathway to Pokhran II: The Prospects and Sources of New Delhi’s Nuclear Weapons Program,” *International Security* 23 (Spring 1999), p. 149; C. Raja Mohan, “India’s Nuclear Weapons and the Asian Balance,” *Indian Defence Review* 13 (July-September 1998), p. 19; and, Rahul Bedi, “Interview [with] George Fernandes,” *Jane’s Defence Weekly* 29 (July 1, 1998), p. 32.

¹² There are several analyses about Pakistani nuclear motivations, to include Samina Ahmed, “Pakistan’s Nuclear Weapons Program: Turning Points and Nuclear Choices,” *International Security* 23 (Spring 1999), pp. 178-179; and Abdul Shakoor Khakwani, “Nuclear Proliferation in South Asia: A Case for the Regional Consensus,” *Pakistan Horizon* 47 (July 1994), pp. 88-90.

¹³ Robert Karniol, “Interview [with] Senator Sartaj Aziz,” *Jane’s Intelligence Review* 30 (November 25, 1998), p. 32. Also see Farzana Shakoor, “Nuclearization of South Asia and the Kashmir Dispute,” *Pakistan Horizon* 51 (October 1998), pp. 67, 73-74; and, Mahmood, “India and Pakistan’s,” p. 50.

¹⁴ Devin T. Hagerty, “South Asia’s Nuclear Balance,” *Current History* 95 (April 1996), p. 169.

¹⁵ See the cogent comments on the difficulties of “un-proliferation” in George Perkovich, *India’s Nuclear Bomb: the Impact on Global Proliferation* (Berkeley: University of California Press, 1999), p. 445.

¹⁶ Ramseh Chandran, “Clinton Finds Line of Control Most Dangerous Place in World,” *Times of India*, March 11, 2000, p. 1.

¹⁷ Scott D. Sagan and Kenneth M. Waltz, *The Spread of Nuclear Weapons: A Debate* (New York: W.W. Norton, 1995), p. 45.

¹⁸ Maleeha Lodhi, “Security Challenges in South Asia,” *Nonproliferation Review* 8 (Summer 2001), p. 119.

¹⁹ See Hagerty, “South Asia’s Nuclear Balance,” pp. 166-167; William C. Martel and William T. Pendley, *Nuclear Coexistence: Rethinking U.S. Policy to Promote Stability in an Era of Proliferation*, Air War College Studies in National Security No. 1 (Maxwell AFB, AL: Air University Press, 1994), pp. 23, 75-76; and, K. V. Gopalakrishnan, “Are Nuclear Weapons That Bad?” *Indian Defence Review* 11 (July-September 1996), pp. 30-31.

²⁰ Lewis A. Dunn, “What Difference Will It Make?” in Robert J. Art and Kenneth N. Waltz, eds., *The Use of Force: Military Power and International Politics*, 4th ed. (Lanham, Maryland: University Press of America, 1993), p. 516.

²¹ For a recent discussion of the inadequacy of ascribing the U.S./USSR stalemate to South Asia, see Michael Quinlan, “How Robust is India-Pakistan Deterrence,” *Survival* (Winter 2000-2001), pp. 141-154.

²² This is true at least for the period during the existence of the Soviet Union; concerns over theft in the former Soviet Union helped drive the Nunn-Lugar program.

²³ See Martel and Pendley, pp. 34-35, 76-77; Joseph S. Nye, Jr., “New Approaches to Nuclear Proliferation Policy,” *Science* 256 (May 29, 1992), p. 1293; and, Mario E. Carranza, “An Impossible Game: Stable Nuclear Deterrence after the Indian and Pakistani Tests,” *Nonproliferation Review* 6 (Spring-Summer 1999), p. 12. However, the reduction of pressures for launch on warning could not completely eliminate the conscious choice to continue with a forward

leaning posture. As pointed out by Bruce Blair, “[despite differences in U.S. and Soviet C2 philosophies], there exist two common denominators that have profoundly shaped the nuclear postures of both states: command vulnerability and launch on warning. The former drove both command systems to adopt the latter. Rapid reaction, or literal launch on warning... created the greatest danger of nuclear inadvertence in a crisis.” See Bruce G. Blair, *The Logic of Accidental Nuclear War* (Washington, DC: Brookings Institution, 1993), pp. 113-114. Additionally, there are still limits and cautions to consider if India and Pakistan were to adopt a U.S.-style C2 system.

²⁴ Francois Heisbourg, quoted in Carranza, “An Impossible Game,” p. 20.

²⁵ See V.R. Raghavan, “Limited War and Nuclear Escalation in South Asia,” *Nonproliferation Review* 8 (Fall-Winter 2001), pp. 82-98.

²⁶ Carranza, “An Impossible Game,” p. 15; Kanti Bajpai, “The Fallacy of an Indian Deterrent,” in Amitabh Mattoo, ed., *India's Nuclear Deterrent: Pokhran II and Beyond* (New Delhi: Har-Anand Publications, 1999), pp. 178-179; C. Uday Bhaskar, “The May 1990 Nuclear ‘Crisis’: An Indian Perspective,” *Studies in Conflict and Terrorism* 20 (October-December 1997), p. 325; Jasjit Singh, “The Wars That Never Were,” *India Today* (New Delhi), April 12, 1996; P.R. Chari, “India’s Nuclear Doctrine,” p. 127; and, Prasun K. Sengupta, “The Defence of Pakistan,” *Asian Defence Journal* (July 1999), p. 28.

²⁷ See Scott D. Sagan, “Nuclear Safety and Security in South Asia,” in Michael Barletta, ed., *Proliferation Challenges and Nonproliferation Opportunities for New Administrations*, Occasional Paper No. 4, Monterey Institute of International Studies, Center for Nonproliferation Studies, 2000, pp. 37-38.

²⁸ Seymour M. Hersh, “On the Nuclear Edge,” *New Yorker*, March 29, 1993, pp. 56-73. Admittedly other commentators have raised objections to this interpretation of both incidents. For example, Hagerty cites numerous U.S. and South Asian officials involved in the 1990 crisis who claimed that the nuclear aspect was over-exaggerated by certain U.S. officials. See Devin T. Hagerty, “Nuclear Deterrence in South Asia: The 1990 Indo-Pakistani Crisis,” *International Security* 20 (Winter 1995/1996). The key lesson learned is that what may in fact be myth has now taken on the guise of a seemingly useful bluff.

²⁹ Ahmed, “Pakistan’s Nuclear Weapons,” pp. 189-190.

³⁰ Stephen Cohen, quoted in Celia W. Dugger, “India and Pakistan Add to War Footing,” *New York Times*, December 28, 2001, p. 10.

³¹ See comments by an anonymous U.S. official regarding the dangers inherent in India’s recent willingness to gamble that Pakistan would not resort to NW if attacked and the absence of clear thresholds for such use in Seymour M. Hersh, “The Getaway,” *New Yorker*, January 28, 2002, p. 40. For other reports on India’s over-confidence that it could control conventional conflict and bypass the nuclear stalemate see Rajiv Chandrasehran, “For India, Deterrence May Not Prevent War,” *Washington Post*, January 17, 2002, p. 1.

³² Joseph Cirincione, “The Asian Nuclear Reaction Chain,” *Foreign Policy* (Spring 2000), p. 127. Also, see *Hindu*, June 1, 1999, cited by Chari, note 27; and, Tehmina Mahmood, “Kargil Crisis and Deteriorating Security Situation in South Asia,” *Pakistan Horizon* 52 (October 1999), p. 31.

³³ Amit Gupta, interview with author, April 27, 2001.

³⁴ Quinlan, “How Robust is India-Pakistan Nuclear Deterrence,” p. 146.

³⁵ Various formal briefings and sidebar conversations between senior Indian military officials and U.S. Air War College delegation, March 5-9, 2001.

³⁶ Bill Gertz, “India, Pakistan Prepares for War,” *Washington Times*, December 31, 2001, p. 1.

³⁷ Hersh, “The Getaway,” p. 40.

³⁸ Safeguards include: weapon lock-out technologies; communications; intelligence and early warning systems; personnel reliability programs; and various standard operating procedures. These are discussed later in the paper.

³⁹ Stephen J. Cimbala, “Nuclear Crisis Management and Information Warfare,” *Parameters* 29 (Summer 1999), pp. 121-122.

⁴⁰ Rear Admiral Raja Menon, *A Nuclear Strategy for India* (New Delhi: Sage Publications, 2000), pp. 241-242.

⁴¹ Any C2 system will inherently have a mix of positive/delegative and negative/assertive controls. Pragmatically, for purposes of mere deterrence, even the most reluctant NW state would eschew a “pure” negative/assertive C2 set-up. The goal of the United States should be to lead India and Pakistan to a C2 system in which the positive/delegative mechanisms are subdued.

⁴² Peter D. Feaver, “Command and Control in Emerging Nuclear Nations,” *International Security* 17 (Winter 1992-1993), pp. 169-170.

⁴³ The purpose of such a negative/assertive C2 system is in part to “guard against four dangers: (1) nuclear yield resulting from an accident, (2) deliberate unauthorized release, (3) inadvertent unauthorized release, and (4) hostile seizure.” See Peter Stein and Peter Feaver, *Assuring Control of Nuclear Weapons: The Evolution of Permissive Action Links* (Cambridge: Center for Science and International Affairs, 1987), pp. 66. While the United States and others may support such a system to prevent theft of nuclear materials for their own selfish reasons, a secondary if overlooked purpose particularly pertinent in the South Asian case is for mutual assured reassurance during crises between India and Pakistan.

⁴⁴ The real key issue for making a safe, secure nuclear arsenal is to address the problem of weapon systems vulnerability. This will drive in large measure whether a country opts for a posture favoring preemptive launch, launch-on-warning or launch-under/after-attack. For example, if a state is confident of its ability to ride out an attack, it might also retain tight centralized control of its weapons. However, if it fears a decapitating strike against its leadership or a disarming strike against its arsenal (especially small arsenals such as those of India and Pakistan), it will very likely move to delegating release of the weapons, moving dangerously to first-use or launch on warning posture, no matter what its doctrine may be. See Carranza, “An Impossible Game,” pp. 12, 18-19. A stable, safe force requires not just a strict C2 system but also: (1) the ability to survive a first strike; (2) delivery systems able to reach their target and penetrate any defenses along the way (e.g., ballistic missiles versus aircraft); (3) a low risk of physical accidents; (4) the capability of a flexible response; and (5) reasonable procurement/operational costs. See Gregory S. Jones, “From Testing to Deploying Nuclear Forces: The Hard Choices Facing India and Pakistan,” RAND/Project Air Force Issue Paper, RAND, Santa Monica, CA, 2000, p. 1. However, the concept of providing Indian and Pakistan with invulnerable weapon delivery systems (e.g., submarines, ballistic missiles, or hardened silos), technologies, or design would be far too radical to reasonably consider. In the absence of such intrinsic force safeguards, it is no small wonder why the United States has pressed India and Pakistan to not assemble or deploy their weapons (i.e., to keep them at a low state of readiness and thus less liable to preemptive use). How long this state will last is another matter entirely and largely a matter impervious to outside influence.

⁴⁵ Sagan, “Nuclear Safety,” p. 38.

⁴⁶ For example, the draft doctrine emphasizes a centralized nuclear command organization under civilian control, an extensive intelligence and early warning network, a robust C2 system for continuity of operations, and full and redundant safeguards against theft or accidental or unauthorized use. See “Indian Nuclear Doctrine,” reprinted in *Indian Defence Review* 14 (July-September 1999), pp. 34-35.

⁴⁷ Observers such as Gurmeet Kanwal and Rear Admiral Raja Menon have done a great deal of work outlining more specific requirements for India’s nuclear arsenal. See Gurmeet Kanwal, “Nuclear Defence: Shaping the Indian Arsenal,” *Indian Defence Review* 15 (Oct-Dec 2000), pp. 36-42; and Menon, *A Nuclear Strategy for India*. Work is also slowly proceeding on a hardened command post in New Delhi. See Koch, “India and Pakistan,” p. 39.

⁴⁸ A.Q. Khan, quoted in Sagan, “Nuclear Safety,” p. 38.

⁴⁹ In the words of Brigadier Ali Halid, the Director General of the Strategic Plans Division and a senior Pakistani officer responsible for the country’s nuclear program, during March 13, 2001, discussions with the U.S. Air War College delegation, “Pakistan has a robust C2 system for controlling and safeguarding its nuclear weapons.” His briefing on further details matched many of the observations made by Koch, “India and Pakistan,” p. 39. Unfortunately, the Pakistanis politely demurred when asked to provide copies of their briefing slides to the author.

⁵⁰ Rahul Bedi, “Head to Head Over History,” *Courier Mail*, January 5, 2002, p. 25.

⁵¹ Quinlan, “How Robust is India-Pakistan Nuclear Deterrence,” p. 152.

⁵² Bruce G. Blair, *Strategic Command and Control: Refining the Nuclear Threat* (Washington, DC: Brookings Institution, 1985), pp. 302-303.

⁵³ Separation of the warheads from delivery vehicles as well as joint military/civilian custody of the trigger mechanism for reasons of safety is the current Indian approach, according to Kanwal, “Nuclear Defence,” pp. 40-41.

⁵⁴ Molly Moore and Kamran Khan, “Pakistan Moves Nuclear Weapons,” *Washington Post*, November 11, 2001, p. 1.

⁵⁵ Barry Bearak, "In Pakistan, A Shaky Ally," *New York Times*, October 2, 2001, p. A1. This pattern, apparent to the author a decade ago, was reinforced in private conversations with several senior Pakistani officers in spring 2001. While this division is admittedly a gross generalization, these senior officers admitted a distaste and distrust of those they termed "fundis" (short for fundamentalists). Ironically, during the Air War College delegation's visit to Pakistan in March, Pakistani officials publicly consistently rejected the possibility that its military had been "Talibanized."

⁵⁶ Koch, "India and Pakistan," p. 39.

⁵⁷ In the words of Geoffrey Forden, a specialist on Russia's early warning system, "the value of an early-warning system is not so much that it doesn't give false alarms, but lets you know that benign events are benign." See Jonathan S. Landay, "A Decrepit Russia Raises Nuclear Fears," *Detroit Free Press*, May 2, 2001, p. 1.

⁵⁸ Examples include Pakistan against India in 1965, and India against Pakistan in 1971. See Ahmed Rashid, "Pakistan and India Continue Vast Mobilization at Border," *Wall Street Journal*, January 8, 2002, p. 13.

⁵⁹ Hersh, "The Getaway," p. 40.

⁶⁰ Witness the reports of Pakistan's infamous Inter Services Intelligence continuing to support the Taliban after U.S. air strikes began as well as complicity in the attack on the Indian Parliament.

⁶¹ It is the author's opinion that a reliance on less timely espionage and human intelligence (HUMINT) collection does not meet with the precise and time-sensitive demands of a potential nuclear conflict. These demands can best be served by technical (e.g., imagery (IMINT), signals (SIGINT), and MASINT) collection. However, according to Brigadier Syed Khalid, Director of Military Intelligence, Pakistan Army Headquarter's Staff, Pakistan is most heavily reliant on HUMINT for indications of Indian activity. Discussions between Joint Staff Headquarters (Pakistan) officials and U.S. Air War College delegation, March 13, 2001. While HUMINT can give good insights to an adversary's intentions and may well be the only source on terrorist or criminal activity, it suffers from very slow dissemination and extreme subjectivity.

⁶² Hersh, "On the Nuclear Edge," pp. 59-60; and Desmond Ball, *Signals Intelligence (SIGINT) in South Asia: India, Pakistan, Sri Lanka (Ceylon)*, Canberra Papers on Strategy and Defence No. 117, Australian National University, Canberra, Australia, 1996, pp. 28-29, 32, 36-37.

⁶³ Kargil Commission Report, <<http://alfa.nic.in.rs/general/25indi1.htm>>. For commentary on the report, see S. Ramkumar, "Kargil Failure: An Opportunity for Intelligence Reform," *Indian Defence Review* 15 (January-March 2000), pp. 28-29; Maj. Gen. Afsir Karim (retired), "Kargil: Quantifying Failure and Success," *Indian Defence Review* 15 (April-June 2000), pp. 31-32; and Air Marshal B. D. Jayal (retired), "The Kargil Review Committee Report: A Mindset Frozen in 1962 Era," *Indian Defence Review* 15 (April-June 2000), pp. 35-36.

⁶⁴ Kanti P. Bajpai et al., eds., *Brasstacks and Beyond: Perception and Management of Crisis in South Asia* (New Delhi: Manohar Publishers, 1995), p. 105.

⁶⁵ Celia W. Dugger, "India Test-Fires Intermediate-Range Missile," *New York Times*, January 25, 2002, p. 6.

⁶⁶ Quinlan, p. 147.

⁶⁷ Farah Zahra, "Pakistan's Road to a Minimum Nuclear Deterrent," *Arms Control Today* 29 (July-August 1999), p. 3; Jones, "From Testing to Deploying," pp. 4-5; Menon, *A Nuclear Strategy for India*, p. 248; and, Bajpai, "The Fallacy of an Indian Nuclear Deterrent," p. 171. India's absence of a missile warning capability was reconfirmed in discussions with senior officials at Headquarter's Western Air Command. Discussions with the U.S. Air War College delegation, Mar 5, 2001.

⁶⁸ This situation is worsened by the vulnerability of their weapon systems, the questionable survivability of their current C2 system, and—at least for Pakistan—the fragile nature/dubious political authority of their governments. Still, a robust intelligence and early warning network can go only so far, especially if either side has a profound distrust of the other's intentions. As Bruce Blair noted, "both the U.S. and Soviet command and control systems strained to detect an attack. Both were also strongly disposed to give the launch orders, unlock codes, and targeting instructions before definitive evidence of massive damage had accumulated... The danger of inadvertent war that stemmed from this stance was greater than has generally been recognized. The danger was compounded by two features of the U.S. system. First, the U.S. posture

depended on a warning system that... was more prone to infer an enemy attack from ambiguous evidence. Second, U.S. contingency plans rapidly and irreversibly dispersed discretionary authority to order SIOP implementation in the event of initial disruption to the normal chain of command." See Blair, *The Logic of Accidental War*, p. 217.

⁶⁹ If there was one matter on which both senior Indian and Pakistani officials acted in concert, it would be their extreme reluctance to discuss any elements of this specific C2 issue with the author or any other member of the U.S. Air War College delegation in March 2001. However, Gurmeet Kanwal, a noted Indian military analyst on nuclear issues, recently outlined a recommended methodology to securely pass authorized orders to launch NW via a two-part message. See Kanwal, "Nuclear Defence," p. 40. Whether this has or will be implemented is of course unknown, but it shows the seriousness with which the Indians are handling their nuclear arsenals. It is likely that the Pakistanis are similarly engaged in establishing strict C2 requirements. Whether either can make this happen is another matter altogether.

⁷⁰ Scott D. Sagan, *The Limits of Safety: Organizations, Accidents, and Nuclear Weapons* (Princeton: Princeton University Press, 1993), p. 266.

⁷¹ Regarding concerns about the high cost of a C2 system see Ahmed, "Pakistan's Nuclear Weapons," p. 199; and Heisbourg, "The Prospects for Nuclear Stability," p. 82. For a more benign view of India's C2 requirements, see Menon, *A Nuclear Strategy for India*, p. 235; Bajpai, "The Fallacy of an Indian Nuclear Deterrent," pp. 172-173; Kak, in Singh, pp. 270-271, 279-280, 283-284; and Feaver, "Command and Control," note 6.

⁷² Quoted in Kanwal, "Command and Control," p. 57. Also see Menon, *A Nuclear Strategy for India*, p. 257; and George Perkovich, "A Nuclear Third Way in South Asia," *Foreign Policy* 91 (Summer 1993), p. 88.

⁷³ Quinlan, pp. 148-149.

⁷⁴ Feaver, "Command and Control," pp. 160, 162. Also see Bajpai, in Mattoo, pp. 172, 174 for an admission of how little is truly known about the Indian C2 system.

⁷⁵ Pakistan Foreign Minister Abdul Sattar, quoted in Amir Zia, "Pakistan Says Nuclear Materials Ironclad, Rejects Concerns About Their Security," Associated Press wire service, November 1, 2001.

⁷⁶ Feaver, "Command and Control," pp. 178, 180.

⁷⁷ Gregory F. Giles, "Safeguarding the Undeclared Nuclear Arsenals," *Washington Quarterly* (Spring 1993), p. 178; and Carranza, pp. 12, 18-19.

⁷⁸ To date, there has been only one work that addresses the specific C2 needs of a small nuclear arsenal, supporting its argument with a solid conceptual framework. See Jordan Seng, "Less is More: Command and Control Advantages of Minor Nuclear States," *Security Studies* 6 (Summer 1997). Seng argues that minor nuclear powers "will enjoy greater organizational simplicity that stems from the small size and simple composition of their nuclear arsenals" and thus require less extensive C2. While he overestimates the capability of such a state to use concealment to protect its forces as well as the fears of a decapitating strike (thus erroneously driving down the C2-related costs of a small arsenal), he does agree that some form of nuclear-specific C2 system is required.

⁷⁹ Further details can be found in India's draft nuclear doctrine. See "Indian Nuclear Doctrine," pp. 34-35. Detailed recommendations on the command authorities (e.g., multiple command posts, military organizations dedicated to planning/operating strategic NW) can be found in Kanwal, "Nuclear Defence," pp. 39-40; and Menon, pp. 253, 258, 261, 270.

⁸⁰ Atul Aneja, "India Reported to Be Facing Problems in Setting Up Nuclear Command Structure," World News Connection wire service, August 14, 2001; and Rajat Pandit, "Government Overhauling Defence Management," *Times of India*, August 25, 2001.

⁸¹ Jessica Stern, "Pakistan's Jihad Culture," *Foreign Affairs* (November/December 2000), pp. 115-126. Time will tell whether the recent and rapid Pakistani disillusionment with radical Islam will move average Pakistanis along a more moderate religious, cultural, and political path. Much will depend on whether Pakistan as a viable nation will succeed to capture the loyalties and identities of the people in the street. See Doug Struck, "Religious Radicals Facing Backlash in Pakistan," *Washington Post*, January 28, 2002, p. 14.

⁸² Sumit Ganguly, "Pakistan's Never-Ending Story: Why the October Coup Was No Surprise," *Foreign Affairs* (March/April 2000), pp. 2-7.

⁸³ Devesh Kapur, "Quid pro Quo: Aid for Pakistan, Not Its Army," *Asian Wall*

Street Journal, December 7, 2001, p. 11.

⁸⁴ Samina Ahmed, "The (Nuclear) Testing of Pakistan," *Current History* 97 (December 1998), p. 410.

⁸⁵ Kim Murphy, "Pakistan's Jihad Fervor Replaced by Resentment," *Los Angeles Times*, December 3, 2001, p. 1; and Rifaat Hussain, "Pakistan Walks a Tightrope," *Jane's Defence Weekly* (October 24, 2001), p. 23.

⁸⁶ "Mr. Musharraf Speaks," *Washington Post*, January 15, 2002, p. 18.

⁸⁷ Rahul Bedi, "India's Borders Prove Hard to Pin Down," *Jane's Intelligence Review* (October 2001), p. 28.

⁸⁸ Ijaz and Woolsey, "How Secure," p. A25.

⁸⁹ Serge Schonemann and Patrick E. Tyler, "Pakistan Leader Seeks 'Gestures' for Backing US," *New York Times*, November 10, 2001, p. A1. However, specific details as to what has been provided/accepted are unavailable.

⁹⁰ John D. Frketic and others, "Proliferation Management in the Third Nuclear Age: A Strategy and Rules of Engagement," John F. Kennedy School of Government, spring 1996 (unpublished manuscript), pp. 47-50.

⁹¹ See Dan Caldwell, "Permissive Action Links: A Description and Proposal," *Survival* 29 (May-June 1987), pp. 234-235, 183-184; Peter D. Feaver and Emerson M. S. Niow, "Managing Nuclear Proliferation: Condemn, Strike, or Assist," *International Studies Quarterly* 40 (June 1996), p. 210; Heisbourg, pp. 86-89; Feaver, "Command and Control," pp. 182-183, 186; Hagerty, "South Asia's Nuclear," pp. 169-170; Toby F. Dalton, "Toward Nuclear Rollback in South Asia," *Current History* 97 (December 1998), p. 417.

⁹² Robert E. Rehbein, *Informing the Blue Helmets: The US, UN Peacekeeping Operations, and the Role of Intelligence*, Martello Papers No. 16, Queen's University, Kingston, Ontario, 1996, p. 70. No doubt the use of a map briefing board prominently marked "SECRET" to explain the Line of Control from Pakistan's viewpoint to the U.S. Air War College delegation had this as an ulterior motive.

⁹³ Hagerty, "South Asia's Nuclear Balance," pp. 169-170.

⁹⁴ Giles, "Safeguarding the Undeclared Nuclear Arsenals," p. 180.

⁹⁵ Steven Vogel, "India Optimistic Tensions with Pakistan Will Diminish," *Washington Post*, January 18, 2002, p. 15.

⁹⁶ Brigadier Ali Halid, discussions between Joint Staff Headquarters (Pakistan) officials and U.S. Air War College delegation, March 13, 2001. This concept was first reported recently in the defense industry press; see Andrew Koch, "US Aid to Pakistan to Cement Anti-Terror Alliance," *Jane's Defence Weekly* (October 10, 2001), p. 4. Allegedly, though, the idea had been broached to U.S. officials ten years ago by Pakistan. See Seymour Hersh, "Watching the Warheads," *New Yorker*, November 2001, p. 48.

⁹⁷ The recent U.S. go-ahead to Israel to sell the Phalcon airborne warning and control system (AWCAS) to India is a half-start if Pakistan is not offered a similar—if subsidized—capability. See Rahul Bedi, "U.S. Government 'Not' Opposed to sale of Phalcon to India," *Jane's Defence Weekly* (January 10, 2002), p. 5.

⁹⁸ See Lewis A. Dunn and Victor Alessi, "Arms Control by Other Means," *Survival* (Winter 2000-2001), pp. 135-136. Dunn and Alessi offer proposals to expand the U.S./Russian exchange of missile launch data to include a bilateral exchange of the alert status of strategic forces. For India and Pakistan, this may be too visionary, but it could be a goal to strive for.

⁹⁹ Rahul Bedi, "America Helps India to Defend Itself in Kashmir," *London Daily Telegraph*, January 22, 2002, p. 12. Again, as with the airborne warning system, this is a half-measure if both countries are not equally supported.

¹⁰⁰ Bruce G. Blair and John D. Steinbrunner, *The Effects of Warning on Strategic Stability*, Brookings Occasional Papers, Brookings Institution, Washington, DC, 1991, p. 39.

¹⁰¹ Dalton, "Toward Nuclear Rollback in South Asia," p. 417.

¹⁰² Daniel Pearl, "Pakistan Clamps Down on Islamic Militant to Avert War with India, Terror at Home," *Wall Street Journal*, January 2, 2002, p. 1; and Rajiv Chandrasekram, "India, Pakistan Easing Standoff," *Washington Post*, January 2, 2002, p. 7.

¹⁰³ Air Vice Marshall Patney, Vice Chief of Air Staff (India), discussions with senior U.S. Air War College delegation, March 5, 2001. Also, sidebar discussions with senior members of the Indian Air Force Assistant Chief of Staff/Intelligence, March 5, 2001. In Pakistan, this too was a common refrain heard by the author, known by his hosts to be an intelligence officer, in formal and informal discussions with Pakistani senior officials.

¹⁰⁴ Prasun K. Sengupta, "India Restructures Its Intelligence Establishment," *Asian Defence Journal* (September 2001), p. 17.

¹⁰⁵ Hersh, "Watching the Warheads," p. 48.

¹⁰⁶ For example, in 1995, the United States confronted New Delhi with proof from its spy satellites that India was preparing a nuclear test. In 1998—armed with this information—Indian scientists were able to hide the preparations for the series of tests at Pokhran. See Rethninoaraj, "Indian Blasts Surprise the World," pp. 19, 21.

¹⁰⁷ Mushahid Hussain, "Can Pakistan's Leader Hold On?" *New York Times*, October 11, 2001, p. A25.

¹⁰⁸ Koch, "India and Pakistan," p. 39. However, if the United States were to resign itself to the fact that the weapons will one day be deployed no matter what, then it could make the offer again without overly intrusive or restrictive preconditions (except for no third party transfer).

¹⁰⁹ See, for example, Pakistan's rejection of a U.S. proposal to directly provide on-site security for its nuclear arsenal, in fear that U.S. forces might then be able to prevent operational deployment of the weapons. Desikan Thirunarayanapuram Statesmen News wire service, October 19, 2001.

¹¹⁰ Putative reports of U.S. military planning to capture and disarm Pakistan's NW certainly do little to reassure Islamabad (or New Delhi) of our good intentions. See Hersh, "Watching," p. 48; and Jon B. Wolfstahl, "US Needs a Contingency Plan for Pakistan's Nuclear Arsenal," *Los Angeles Times*, October 16, 2001, p. B-17.

¹¹¹ John F. Burns, "Pakistan Atom Experts Held Amid Fears of Leaked Secrets," *New York Times*, November 1, 2001, p. A1.

¹¹² See the emotional editorial by an anonymous Pakistani journalist, "Nuclear Responsibility," *Nation*, June 3, 2001.

¹¹³ Quoted in Gurmeet Kanwal, "Command and Control of Nuclear Weapons," *Indian Defence Review* 13 (April-June 1998), p. 57.

¹¹⁴ Although not necessarily focused on nuclear C2 issues, there has recently been a revival of high-level U.S.-Indian military-to-military talks following a lapse of almost 3 years. In the words of Lalit Mansingh, India's Ambassador to the United States, "the [nuclear] genie can't be put back in the bottle. We have to get beyond and look at common strategic interests." See Ben Barber, "U.S., India Restore Cooperation by Militaries," *Washington Times*, May 3, 2001, p. 1. Although the United States has several additional outstanding issues with Pakistan (e.g., martial law in that country), it gravely risks further isolating Pakistan and risking instability unless similar high-level military-to-military overtures are offered to Islamabad. The March 2001 visit to Pakistan by the U.S. Air War College, after a three year hiatus, was a welcome beginning; but much more is needed and U.S. officials must reengage their Pakistani counterparts and rebuild their trust and confidence (especially among the more skeptical and fundamentalist-oriented younger officers).

¹¹⁵ Great care must be taken to avoid the misperception that the United States is favoring one country over the other. Recent events may cause Pakistan to believe the warming relations between the United States and India are to its disadvantage. Many opinion makers hold the image of Pakistan as a "nearly bankrupt nation with... a military government and an expanding nuclear arsenal is drifting towards religious extremism." See Barry Bearak, "Death to Blasphemers: Islam's Grip on Pakistan," *New York Times*, May 12, 2001, p. A3. For this reason, they come to relish stronger ties with India vis-à-vis defense issues; see Celia W. Dugger, "Rare Praise from India on U.S. Defense," *New York Times*, May 6, 2001, p. A24. Still, it is vital that nuclear C2 be provided in an unbiased and strings-free manner.

¹¹⁶ The author is not a lawyer, so *caveat emptor*.

¹¹⁷ Section 325 (1), Foreign Relations Law of the United States, Restatement of the Law, 3rd edition

¹¹⁸ See Frketic, "Proliferation Management," p. 22.

¹¹⁹ Preamble to the Treaty on the Non-Proliferation of Nuclear Weapons, reprinted in U.S. Arms Control Disarmament Agency, *Texts and Histories of Negotiations* (Washington, DC: U.S. Government Printing Office, 1996), p. 71.

¹²⁰ American policymakers must also work out other issues such as gaining congressional support for funding this initiative (especially if it provides C2 free of charge or at greatly reduced prices), protecting nuclear weapon design secrets and other classified information, and ensuring the support provided is not transferred by India or Pakistan to a third party.

¹²¹ Mazari, p. 6.

- ¹²² See Douglas Frantz, "US and Pakistan Discuss Nuclear Security," *New York Times*, October 1, 2001, p. A3, and Koch, "US Aid," p. 4.
- ¹²³ Burns, "Pakistan Atom Experts," p. A1
- ¹²⁴ See Giles, pp. 182-183; and, Feaver and Niow, pp. 210.
- ¹²⁵ Feaver and Niow, p. 215.
- ¹²⁶ Nye, p. 1295.
- ¹²⁷ Feaver and Niow, p. 210.
- ¹²⁸ Leonard S. Spector, "Neo-Nonproliferation," *Survival* 37 (Spring 1995), p. 66.
- ¹²⁹ See Feaver and Niow, p. 210; Seng, pp. 89-90; and, Giles, p. 183.
- ¹³⁰ Sumit Ganguly, "Behind India's Bomb: The Politics and Strategy of Nuclear Deterrence," *Foreign Affairs* (September/October 2001), p. 141.
- ¹³¹ Statement by Ambassador Robert Blackwill, U.S. Ambassador to India, quoted in Celia W. Dugger, "U.S. Envoy Extols India, Accepting Its Atom Status," *New York Times*, September 6, 2001, p. A8.
- ¹³² Kampani, p. 17.
- ¹³³ Giles, pp. 183-184.
- ¹³⁴ Quoted in C. Raja Mohan, "U.S. N-Assistance to India, Pak?," *Hindu*, August 6, 2001.
- ¹³⁵ Caldwell, p. 224.

- ¹³⁶ James G. Blight and David A. Welch, "Risking 'The Destruction of Nations': Lessons of the Cuban Missile Crisis for New and Aspiring Nuclear States," *Security Studies* 4 (Summer 1995), pp. 824, 847-848; and Blair and Steinbrunner, p. 1.
- ¹³⁷ Nye, p. 1296.
- ¹³⁸ John Andrew Errickson, *The Cuban Missile Crisis of 1962: Miscalculations, Escalation, and Near Nuclear Confrontation*, Master's Thesis, Florida State University, 1994.
- ¹³⁹ Michael Krepon, "A Ray of Hope," *Washington Quarterly* 24 (Spring 2001), p. 175.
- ¹⁴⁰ Salil Tripathi, "Fighting Our Identity," *Asian Wall Street Journal*, January 9, 2002, p. 10.
- ¹⁴¹ Douglas Jehl, "Pakistani Angrily Faults India on Kashmir," *New York Times*, February 6, 2002, p. 1.
- ¹⁴² Shamsah Ahmad, "The Nuclear Subcontinent: Bringing Stability to South Asia," *Foreign Affairs* 78 (July-August 1999), p. 125.
- ¹⁴³ Ben Barker, "Powell Lauds Pakistan's Efforts against Extremists," *New York Times*, January 17, 2002, p. 3.
- ¹⁴⁴ Alexander Evans, "Why Peace Won't Come to Kashmir," *Current History* 100 (April 2001), p. 173.