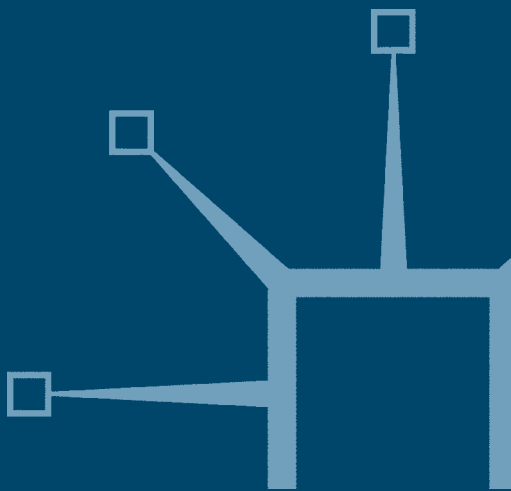
palgrave
macmillan

NUCLEAR RISK REDUCTION IN SOUTH ASIA

Edited by

Michael Krepon



Nuclear Risk Reduction in South Asia

This page intentionally left blank

Nuclear Risk Reduction in South Asia

Edited by
Michael Krepon

palgrave
macmillan

A Henry L. Stimson Center Book

First published 2004 by
PALGRAVE MACMILLAN™
175 Fifth Avenue, New York, N.Y. 10010 and
Houndmills, Basingstoke, Hampshire, England RG21 6XS
Companies and representatives throughout the world

PALGRAVE MACMILLAN is the global academic imprint of the Palgrave Macmillan division of St. Martin's Press, LLC and of Palgrave Macmillan Ltd. Macmillan® is a registered trademark in the United States, United Kingdom and other countries. Palgrave is a registered trademark in the European Union and other countries.

ISBN 1–4039–6702–4

Library of Congress Cataloging-in-Publication Data
Nuclear risk reduction in South Asia / Michael Krepon, editor.
p. cm.
"A Henry L. Stimson Center book."
Includes bibliographical references and index.
ISBN 1–4039–6702–4
1. Nuclear weapons—South Asia. 2. South Asia—Military policy. 3. Nuclear disarmament—South Asia. 4. South Asia—Politics and government—21st century. I. Krepon, Michael, 1946– II. Henry L. Stimson Center.

UA832.7.N83 2004
327.1'747'0954—dc22 2004045506

A catalogue record for this book is available from the British Library.

Design by Newgen Imaging Systems (P) Ltd., Chennai, India.

First edition
10 9 8 7 6 5 4 3 2 1

Printed in the United States of America.

Contents

Preface

The Stimson Center is pleased to present this updated volume of essays, which have appeared over the past decade in various publications on the general theme of reducing the risk of nuclear war between India and Pakistan. Over the years, the Stimson Center, under the leadership of its founding president and current project director for South Asia, Michael Krepon, has examined the evolving state of thinking about nuclear danger in the Subcontinent by U.S. arms-control experts and by intellectuals and decision makers in the region. We are proud to have been involved in this critical and changing conversation about one of the most serious threats facing the international community today.

The current volume pulls together a selection of chapters from previously published work, organized into three main sections. It begins with three essays that are largely theoretical, and introduce the vocabulary and methodology of nuclear risk reduction as it has evolved since the end of the Cold War. The second section addresses more specific measures that could be considered in the South Asian arena, and tries to take into account which of these various "tools" of risk reduction might fare best in the turbulent waters of the region. The final section examines the consequences and implications of missile defense options for stability in Asia.

We are cognizant of the fact that these sophisticated ideas and concepts can only contribute to peace if the political environment is receptive. We are aware that the application of these ideas requires a willingness to seek outcomes that address the needs of all parties, not the zero-sum approach that too often characterized thinking in the region. So we know that our contribution here is but a piece of a larger puzzle. There is much work to be done by diplomats, politicians, journalists, and military thinkers, and leaders, to create a political and psychological context for risk-reduction efforts. We hope that they and others will find this volume useful.

Ellen Laipson
President and Chief Executive Officer,
The Henry L. Stimson Center

This page intentionally left blank

Introduction

Michael Krepon

The Stimson Center began programming on confidence building and nuclear risk reduction on the Subcontinent in 1991. Back then, we believed that the Cold War experience in such matters would be of interest to policy makers, military leaders, and researchers in India and Pakistan. We understood that the Cold War experience between the two nuclear superpowers was unique, but we hoped that some of the techniques and procedures applied to reduce nuclear danger and build confidence might usefully be adapted for this region. A mutual learning process ensued as U.S. advocates began to understand more clearly the complexities of the Subcontinent, while strategic analysts within the region dropped reflexive opposition to concepts derived from the Cold War.

Over time, a creative synthesis began to emerge as U.S. analysts spent more time in South Asia, and as our colleagues in the region began to appreciate more deeply the dangers associated with offsetting nuclear weapon capabilities. The old days, when Americans would confidently offer "fixes" and when South Asians would abruptly reject external prescriptions, are thankfully behind us. Substantive interactions have become possible as a result of a decade of conversations that have generated mutual respect and a common desire to learn from one another. This synthesis was nurtured in "Track II" meetings, a process which is sometimes maligned, but which has periodically infused official government-to-government interactions with useful ideas. Indeed, many of the proposals found in these pages have found expression in proposals subsequently suggested by the Indian, Pakistani, and U.S. governments.

Developing professional contacts and working relationships with colleagues half-a-world away has been extremely rewarding. It is also gratifying to hear echoes of analyses nurtured by the Stimson Center emanating from capitals. This work has also been extremely frustrating. Good ideas have repeatedly been stymied by political impasses, tragic events, and the imposition of linkages between nuclear risk reduction and progress on other fronts, particularly Kashmir. During the Cold War, we joked that the United States and the Soviet Union often endorsed the same positions—but not at the same time. This maddening phenomenon is not unknown to South Asia, as well.

Much work is needed to reduce nuclear dangers on the Subcontinent. The "stability–instability" paradox that was formulated in the West to

characterize the dangers of nuclear deterrence is alive and well in South Asia. This paradox holds that, while offsetting nuclear capabilities might indeed prevent a full-blown conventional or nuclear war, the presence of these fearsome weapons could also encourage the use of violence at lower levels in the expectation that escalation would be contained by a mutual desire to avoid the nuclear threshold.

One fundamental premise behind the stability–instability paradox—heightened tensions and increased violence at lower levels—is beyond dispute. Kashmir has been inflamed since the advent of covert nuclear capabilities on the Subcontinent, and tensions have grown even more pronounced with the demonstration of overt nuclear capabilities in 1998. The region is now experiencing crises with greater frequency and severity. One such crisis erupted into a limited war in the heights above Kargil in 1999. For almost a year after Islamic extremists attacked the Indian parliament in December 2001, over one million soldiers assumed battle-ready positions along the Kashmir divide and the international border. Despite these crises, conventional war has been avoided, and the nuclear threshold has not been crossed. Perhaps both tenets of the stability–instability paradox will hold true in South Asia, as was the case during the Cold War. Much is now being left to chance, however. As of this writing, nuclear risk reduction measures have not been formally implemented between India and Pakistan. Serious, sustained effort is required to act on the analysis and to put in place the recommendations offered in these pages.

These essays first appeared in reports released by the Henry L. Stimson Center, beginning in 1994. They have been updated and reproduced in one volume because of their heightened relevance and to introduce this body of work to new readers. When the Stimson Center first began publishing these essays, we focused more on confidence-building measures (CBMs) than on nuclear risk reduction. We hoped that CBMs might be pursued in a cumulative and progressive fashion so as to facilitate a resolution of highly contentious issues. This hope foundered on the region's hard geopolitical realities. During the 1990s, CBMs were often viewed as temporizing rather than permanent measures. Sometimes they were adopted in the wake of a crisis to demonstrate responsible behavior to Washington and other foreign capitals. When the crisis was over, proper implementation by Pakistan or India could be turned on or off to reflect displeasure, to purposefully annoy, or to seek leverage on more important matters. These CBMs were debased because they were treated as tradable commodities rather than as essential goods. They could not serve as a springboard to nuclear risk reduction when national leaders failed to value them and to implement them properly.

Naturally, as nuclear programs evolved and as dangers grew in the region, the Stimson Center's research turned toward nuclear risk-reduction and conflict-avoidance measures. If these arrangements to reduce nuclear danger are also viewed as tradable commodities or as sops to the outside world, India and Pakistan will face an exceedingly long and dangerous passage. The suggestions contained in these pages are not favors to be dispensed by

national leaders; they are essential requirements owed by national leaders to their fellow citizens.

During the Cold War, severe crises produced a renewed and sincere sense of purpose to reduce nuclear dangers. In South Asia, one crisis has led to the next without serious attention to such dangers. The initiation of dialogue, or the successful negotiation of nuclear risk-reduction measures, continues to be predicated on gaining satisfaction on more immediate or more "important" issues. Consequently, one crisis prompts the next, since no crisis ends satisfactorily to both India and Pakistan. Nuclear risk reduction becomes more essential, and more of a hostage to enduring enmities. This cycle can and must, be broken. There is no poverty of ideas in how to do so, as is evident from the essays in this book.

This body of work would not have been possible without the generous grant support of several U.S. foundations. The Stimson Center is grateful to the Carnegie Corporation of New York, the Nuclear Threat Initiative, the William and Flora Hewlett Foundation, and the W. Alton Jones Foundation for providing the resources necessary for our South Asia programming. In addition, the Ford Foundation, the Rockefeller Foundation, and the U.S. Department of Energy provided grant support for the Stimson Center's Visiting Fellows program. Several of these essays were written by former Visiting Fellows. We are extremely proud of this network of Indian and Pakistani journalists, teachers, researchers, and military officers who have made significant contributions to public discourse, teaching, writing, and policy making within the region.

Last but not least, I have been gifted with a strong succession of research assistants who helped greatly in every aspect of the Stimson Center's South Asia programming, including the production and editing of these essays. My sincere thanks go to Matthew Rudolph, Mishi Faruqee, Amit Sevak, Jill Junnola, Sony Devabhaktuni, Jenny Drêzin, Khurshid Khoja, Michael Newbill, Chris Gagné, Chris Clary, Kishore Kuchibhotla, and Ziad Haider. The updating and editing for this volume was coordinated by Chris Gagné, upon whom most of these burdens fell, with the subsequent assistance of Chris Clary and Ziad Haider. I am also grateful for the assistance of Vishal Agraharkar, who prepared the index, and to Sarah Parkinson, David Roeske, and Aaron Wessells. Special thanks go to Michael Flamini, Toby Wahl, and Heather Van Dusen at Palgrave Macmillan.

This page intentionally left blank

I

Reducing Nuclear Dangers

This page intentionally left blank

1

Is Cold War Experience Applicable to Southern Asia?

Michael Krepon

Nuclear risk reduction during the Cold War was a high priority and constant preoccupation of U.S. and Soviet leaders.[1] Over the course of three decades, Washington and Moscow worked hard to put in place nine key elements to prevent the use of nuclear weapons. Despite sustained, high-level efforts to prevent a nuclear exchange and reduce nuclear dangers, U.S. and Soviet leaders experienced several close calls and barely avoided potentially catastrophic accidents.

In vastly different circumstances, India, China, and Pakistan are now at the early stages of developing or modernizing nuclear weapon and ballistic missile capabilities. While recognizing the obvious differences between the U.S.–Soviet experience and the India–China–Pakistan triangular relationship, it might nonetheless be useful to consider whether the key elements of nuclear risk reduction developed elsewhere might also apply in some fashion to southern Asia.

Key Elements of Cold War Risk Reduction

The first key element of nuclear risk reduction in the U.S.–Soviet context was a formal agreement not to change the territorial *status quo* in sensitive areas by military means. The most sensitive Cold War fault lines were divided Germany and Korea. Tacit agreements not to seek changes in the status of Berlin came after the Berlin blockade in 1948–1949, when the Kremlin stopped resupply by land to the western sector of the city, and in 1961, when the Kremlin built a wall to stop emigration from East to West Berlin. The *status quo* in Korea was tested and restored only after a lengthy and costly war. The nuclear shadow hung over the Korean conflict, which erupted in 1949, the same year in which the Soviet Union detonated its first nuclear device. The use of nuclear weapons to end this conflict was advocated by some, but rejected by presidents Harry S. Truman and Dwight D. Eisenhower.[2]

The most serious challenges to the *status quo* in sensitive areas took place in the formative stages of the U.S.–Soviet competition. These

challenges—such as the Kremlin's blockade of West Berlin—occurred despite U.S. nuclear superiority. In this particular case, the shadow of the atomic bomb was ever present. Indeed, President Harry S. Truman ostensibly deployed nuclear-capable B-29 bombers to Great Britain during the Berlin crisis. Nonetheless, the two dominant factors were of a tactical nature—Washington's commitment to conduct a round the clock airlift, and the Kremlin's control over the roadways into Berlin.[3]

After these momentous events, and after the Cuban Missile Crisis, U.S. and Soviet leaders appeared to accept tacitly, but not formally, the territorial *status quo* in particularly sensitive locations. At the same time, both superpowers continued to jockey for advantage where the stakes were lower. When either Washington or Moscow managed to get stuck in a quagmire of their own making in some peripheral location, such as Vietnam or Afghanistan, the other did not hesitate to raise the costs. At times this led to brief military interactions, such as when U.S. aircraft bombed Russian ships supplying North Vietnam and air defense sites manned by Russian advisors assisting Hanoi. But competition on the periphery was not allowed to escalate to central strategic concerns in Europe and in nuclear arms control negotiations. This was most evident in May 1972, when President Richard M. Nixon dramatically escalated the U.S. bombing campaign in North Vietnam before traveling to Moscow to conclude the first Strategic Arms Limitation accords.

The tacit agreement not to seek territorial changes by force of arms was formalized in the Helsinki "Final Act" in 1975. The guiding principles of the Helsinki accord were respect for sovereign equality and the territorial integrity of participating states, rejection of force or threat to use force, and the inviolability of frontiers. These principles were given added weight because 35 heads of state with a direct stake in avoiding another war in Europe endorsed them. Indeed, the allies of the two superpowers as well as nonaligned and neutral countries were instrumental in brokering this agreement.

The Helsinki accord was immediately denounced by those in the United States who viewed the outcome as a capitulation and as an acceptance of "captive peoples" in Eastern Europe by President Gerald R. Ford and his administration. In point of fact, states that fell into the Soviet orbit against their will were strong supporters of what became known as the "Helsinki process," eventually becoming its principal beneficiaries.

Critics of a U.S. policy of engagement with the Soviet Union held the pessimistic view that *détente* would work to the Kremlin's advantage. In retrospect, engagement proved to be as essential as containment in winning the Cold War. While the Helsinki accord barred any change in the territorial *status quo* by force of arms, it did not freeze the division of Europe. To the contrary, Helsinki facilitated a wide variety of East–West interactions, which over time, helped to change the *status quo*. The process of engagement and the standards set in the Helsinki accord were late in coming, however. Washington and Moscow did not agree to a code of political conduct until 25 years after the nuclear standoff was established.

A second key element of Cold War nuclear risk reduction was tacit agreement by U.S. and Soviet leaders to avoid nuclear brinksmanship in each other's neighborhood. The most well-documented and harrowing case of nuclear brinksmanship was the Cuban Missile Crisis in 1962, which involved the forward deployment of tactical nuclear weapons, the shipment by sea of missiles designed for nuclear attack, and the imposition of a blockade by one superpower against another on the high seas.

Some historians have argued that the Kremlin's surreptitious effort to place tactical nuclear weapons and missiles in Cuba were defensive maneuvers, prompted by fears of another U.S.-backed effort to overthrow Fidel Castro.[4] Even if this were the case, Moscow's forward deployment of nuclear weapons and missiles was certainly not perceived by U.S. leaders as defensive in nature. Nor did Soviet leaders view the deployment of U.S. missiles based in Turkey as a defensive posture. Rather, the forward deployment of nuclear-capable weapon systems during the Cold War was widely viewed as an offensive threat, not as a reinforcement of the *status quo*.

It is worth noting that the Cuban Missile Crisis came 13 years after the Soviet Union joined the United States as a nuclear weapon state. Offsetting U.S. and Soviet nuclear capabilities did not reduce the severity of the Cuban Missile Crisis, nor did they produce stabilizing or cautious behavior. To the contrary, the Kremlin's security concerns were not alleviated by joining the nuclear club. Indeed, some historians postulate that a growing asymmetry in U.S. and Soviet nuclear capabilities prompted the Kremlin to take this desperate gamble in search of a quick "missile-gap repair."[5] This crisis, which led to the removal of ballistic missiles from both Cuba and Turkey, did have a chastening effect, however. After this brush with nuclear disaster, U.S. and Soviet leaders continued to jockey for geopolitical advantage—but with a common understanding not to play for such high stakes so close to each other's home.

A third key element of Cold War nuclear risk reduction was a common agreement by Washington and Moscow to minimize or avoid dangerous military practices. In the early decades of their strategic competition, U.S. and Soviet forces engaged in activities with a potential for grave escalation or accidents. Surface naval vessels and submarines collided or jostled for position in strategically sensitive bodies of water; combat aircraft carried out warfighting exercises in close proximity to national borders; and provocative intelligence-gathering operations were carried out. Guidelines to lower the temperature of US–Soviet military interactions, like the Helsinki Final Act, took time to be realized. The first such agreement, to avoid incidents at sea, was negotiated in 1972—more than a decade after the Cuban Missile Crisis. The "IncSea" accord started a process that continued until the end of the Cold War, when an agreement to prevent dangerous military practices on land and in the air was belatedly negotiated in 1989.

Special reassurance measures for ballistic missiles and nuclear weapon systems were a fourth key element of Cold War nuclear risk reduction. Reassurance was provided by formalized, prior notifications of missile launches, and other arrangements, embedded in treaties, requiring

transparency in the deployment and dismantlement of nuclear forces. These reassurance measures were also slow in coming. Typically, nuclear weapon states just beginning to develop their capabilities are not inclined to clarify their holdings. In such circumstances, transparency could demonstrate weakness rather than strength, or facilitate an adversary's targeting. In addition, the military and strategic cultures of most states do not prize openness. Transparency is an acquired habit—one that nuclear powers usually accept only after they believe they have acquired an assured second-strike capability.

The first reassurance measure related to nuclear weapons was a commitment not to place weapons of mass destruction in outer space or on celestial bodies. This threat was conceivable but remote in 1967, when the Outer Space Treaty was negotiated. In contrast, the 1972 Anti-Ballistic Missile (ABM) Treaty imposed restraints on existing military capabilities. In this accord the United States and the Soviet Union agreed not to deploy national missile defenses on land, at sea, or in space. The ABM Treaty sanctified "national technical means" as instruments to monitor treaty obligations and forbade both countries from interfering with these remote capabilities, mostly satellites, as well as from engaging in deliberate concealment measures to impede verification.

Killing or disabling satellites, like deploying missile defenses, was well within U.S. and Soviet military capabilities. Had standard military impulses dominated policy, both superpowers would not have accepted defenselessness to missile attacks. Nor would the ABM Treaty's prohibition against the weaponization of space have been accepted. Instead, the Pentagon and the Soviet Ministry of Defense would have contested the high ground of space. Had the weaponization of space and anti-satellite capabilities been pursued in the same manner as other aspects of the military competition, there would have been little reassurance to monitor treaty obligations—assuming such accords could have been negotiated. The marriage of reassurance and restraint made nuclear arms control possible during the Cold War.

A fifth key element in Cold War nuclear risk reduction was trust in the faithful implementation of treaty obligations. Without trust, these arrangements were nothing more than paper promises. On occasion, trust was generated through unilateral or reciprocal actions, such as by the removal from operational status of the least safe and secure nuclear weapons in 1989 by presidents George Bush and Mikhail Gorbachev. This extraordinary set of undertakings was carried out against the backdrop of treaty obligations previously negotiated—the 1987 Intermediate-Range Nuclear Forces Treaty. Unilateral measures that are not backed up by treaty obligations might still be useful, but they are also likely to be more tenuous.

Treaties that are faithfully executed build trust, and trust in treaty obligations requires verification. As President Ronald Reagan used to say—quoting from a Russian proverb—"Trust, but verify." Verification was the sixth key element of Cold War nuclear risk reduction. U.S. and Soviet leaders did not believe in each other's pronouncements—at least not during much of the competition. (During the Cuban Missile Crisis, for example, the Kremlin

flatly denied having placed missiles in Cuba.) All of the key elements of nuclear risk reduction needed to be observed. Word needed to be matched by deed, and deed needed to be monitored. Treaty protections of "national technical means" were therefore not only essential for specific treaty provisions, but also for nuclear risk-reduction measures, broadly defined.

Over time, remote, technical means of monitoring obligations were supplemented by intrusive measures. In 1986, Mikhail Gorbachev convinced his colleagues in the Kremlin to accept on-site inspections, a historic shift in Soviet military culture. After being successfully applied in the Stockholm accord relating to confidence building in Europe, on-site inspections were then negotiated for subsequent nuclear arms-control and reduction treaties. The political symbolism of inspections was as important as their substantive value in building trust during the Cold War. Inspections quieted hard-line opponents in both countries, as they demonstrated convincingly how much bilateral relations had changed from the premises still held by committed opponents of cooperation. Successful blocking actions in the past were based on a lack of trust; inspections at military installations previously closed to foreigners removed these roadblocks, facilitating ambitious accords that greatly increased reassurance while reducing nuclear risks. On-site inspections were not used to score points, to place one another at a disadvantage, or to engage in public relations exercises. Instead, inspections were businesslike, focused on monitoring very specific obligations spelled out in treaty texts.[6] On-site inspections symbolized a sea change in relations by demonstrating a willingness to accept harder tests of trust.

The professional conduct of inspections produced other beneficial effects. Responsibility for the implementation of Cold War treaties fell mostly to men in uniform. As a consequence, military bureaucracies took greater "ownership" of the treaties under their care. They took pride in carrying out inspections in a professional manner, and resisted efforts by political figures to politicize the accords. By participating in a direct way in treaty implementation, military institutions became parties to a process of trust based on verification.[7]

A seventh key element in Cold War nuclear risk reduction was the establishment of reliable lines of communication across borders, for both political and military leaders. The first communication channel, the "Hotline," was established immediately after the Cuban Missile Crisis, which clarified the dangers inherent in taking many hours to send, receive, translate, and interpret messages. Subsequently, the Hotline was improved by the establishment of improved communication links.[8]

The eighth key element of nuclear risk reduction during the Cold War was the establishment of reliable and redundant command and control systems, as well as the intelligence capabilities to track the disposition of opposing nuclear capabilities that could cause devastating harm. Unlike nuclear risk-reduction measures such as treaty inspections and Hotline arrangements, which required close collaboration, improvements in command, control, and intelligence capabilities were unilateral undertakings. The expense of these arrangements was considerable, but received a high priority.

The exceptionally large and diverse nuclear forces deployed by the United States and the Soviet Union posed serious challenges for both countries, particularly with respect to the deployment of tactical nuclear weapons. Because both arsenals were large and capable enough to worry national leaders about being greatly disadvantaged in the event of a surprise attack, many thousands of nuclear weapons were kept ready for rapid launch. The requirement for prompt utilization worked at cross-purposes with the requirement for positive central control, a dilemma that U.S. and Soviet leaders resolved primarily by crisis management and by avoiding the nuclear threshold.

The ninth key element of nuclear risk reduction during the Cold War was a mutual U.S. and Soviet commitment not to be satisfied with existing measures. Washington and Moscow worked to upgrade and strengthen nuclear risk-reduction accords in quiet times as well as during crises. As noted above, the original Hotline has been improved considerably. Agreements to minimize dangerous military practices started with naval forces and were then expanded to ground and air forces. Remote monitoring arrangements were supplemented with on-site inspections. At the end of the Cold War, nuclear risk reduction was receiving as much, if not more, attention than in previous chapters, with the negotiation of the 1992 Open Skies Treaty and the broader scope of controls promised in the second Strategic Arms Reduction accord, signed in 1993.

During the Cold War, the body of risk-reduction measures grew considerably. These arrangements were substantive as well as symbolic. The emphasis was on concrete, observable obligations, rather than rhetorical expressions of good intentions. The United States and the Soviet Union were obligated to demonstrate good faith to each other and to the international community. This body of work became no less, and perhaps more, important after the Cold War ended, and a new complex of nuclear dangers came to the fore. Nuclear risk-reduction measures subsequently focused on the safe dismantlement of obsolescent nuclear forces in the former Soviet Union, the control of fissile material and weapons of mass destruction, and the provision of shared early warning arrangements to Moscow. The purposes and techniques of nuclear risk reduction were applicable to vastly different circumstances because the dangers inherent in nuclear weapons and ballistic missiles remained constant.

The tenth key element of nuclear risk reduction during the Cold War was good fortune. Even with all of the measures described above, U.S. and Soviet leaders still found themselves "eyeball to eyeball" with nuclear danger on several occasions. High alert rates compounded nuclear dangers during the Cold War, including aircraft crashes and runway fires involving nuclear weapons.[9]

Evaluating the U.S.–Soviet Experience

Hard work, good fortune, divine intervention—or plain dumb luck—all may have helped U.S. and Soviet leaders to avoid nuclear disaster during the Cold War. No high-ranking official in Washington or Moscow could depend on

intangibles for nuclear safety, however. Consequently, U.S. and Soviet leaders took unilateral steps to improve command and control, deploy redundant and survivable retaliatory nuclear forces, and put in place expensive verification capabilities for monitoring opposing nuclear forces and crisis behavior. These unilateral steps were widely viewed as essential, but insufficient. U.S. and Soviet leaders also needed to engage in cooperative arrangements to build trust, control their nuclear competition, and reduce risks. Cooperative arrangements included treaties requiring intrusive monitoring, executive agreements to avoid or minimize dangerous practices, as well as nuclear risk-reduction and confidence-building measures (CBMs).

Nuclear risk reduction during the Cold War was a central preoccupation of U.S. and Soviet leaders, given the adversarial nature of the geopolitical competition. Citizens in both countries expected their leaders to defend their national interests, but not in a reckless way. As a result, public support for nuclear risk reduction was unflinching, especially during rough patches in bilateral relations.

The U.S.–Soviet experience with nuclear risk reduction is sobering in many respects. To begin with, there were close calls even with the considerable effort expended to avoid crossing the nuclear threshold. Brushes with nuclear confrontation occurred not only in the early stages of the nuclear competition, when they would be most expected, but also after both Washington and Moscow accepted the logic of Mutual Assured Destruction, and after signing two historic strategic arms limitation accords. No sooner had the White House and Kremlin seemingly agreed to safe "rules" of competition, were these rules challenged by Soviet support for Egypt and the Arab world in the 1973 Middle East war. Long after both countries had assembled huge nuclear arsenals, they were still flirting with nuclear disaster. As late as 1983, the Kremlin's paranoid intelligence agencies were watching blood banks in the United States for preparatory signs of a surprise attack, while the U.S. Central Intelligence Agency was issuing worried estimates of a confident Soviet adversary seeking to secure nuclear advantage.[10]

Nuclear weapons prompted paranoid behavior and worst-case thinking for most of the Cold War and clouded intelligence estimates when this war was winding down. The most dangerous nuclear crises occurred from 1947 to 1962, when there was no safety net to accompany an intense phase of geopolitical competition, and when the development and deployment of new nuclear arsenals were underway. During this early phase of the competition, neither side had the monitoring capabilities to determine whether it was ahead or behind in the nuclear arms race. Secrecy protected new nuclear arsenals and transparency increased insecurity. Using the language of western nuclear deterrence theory, neither side had yet acquired assured retaliatory capabilities, and thus new offensive capabilities increased fears of a preemptive strike.

A decade after the Cuban Missile Crisis, this phase of nuclear insecurity formally ended with the signing of the first strategic arms limitation accord and the ABM Treaty in 1972. Nonetheless, the institutionalized anxieties generated by the nuclear competition continued to hold sway. Even after

decades of remote monitoring produced an acquired familiarity with nuclear forces and operations, and even with the "cushion" provided by huge nuclear arsenals, Washington and Moscow suffered from severe miscommunication and spikes in nuclear danger. Hard-liners in both capitals played off of each other in repeatedly pernicious ways, as was evident in the interactions between the Reagan and Andropov administrations.

Lessons for Southern Asia?

The Cold War experience with nuclear risk reduction was obviously unique. It took place in the context of a bipolar strategic and ideological competition. A great physical distance separated the antagonists. Both the United States and the Soviet Union accumulated huge and diverse nuclear arsenals, which were governed by treaty constraints. And both superpowers managed alliances under protective nuclear umbrellas.

Clearly, none of these conditions apply to southern Asia. And yet, the key elements of nuclear risk reduction during the Cold War still appear to be applicable. Regional stability and risk reduction in southern Asia obviously require tacit or formal agreements not to change the territorial *status quo* in sensitive areas by military means. How could India, Pakistan, and China reduce nuclear risks if they engage in brinksmanship along national borders or lines of actual control? In southern Asia, no less than along the inter-German or Korean borders, there is an evident need to minimize or avoid dangerous military practices. Nuclear risk reduction between India and Pakistan or between China and India is very hard to envision without special reassurance measures directly related to weapon systems that are most worrisome. The absence of trust in the faithful implementation of agreed obligations is no less corrosive between India and Pakistan or India and China than it was between the United States and the Soviet Union. Proper implementation of risk-reduction agreements reached is therefore required in both cases, as is the imperative to build trust through verification. It is also self-evident that nuclear risk reduction, regardless of region, requires reliable lines of communication across borders, redundant command and control systems, and ceaseless attention.

The essential question, then, is not whether, but how, the key elements of nuclear risk reduction should best be adapted to southern Asia's unique strategic and political cultures, geography, geopolitics, and nascent nuclear and missile programs.

The regional competition in southern Asia consists of two dyads—India versus Pakistan, and China versus India—and one triangle. In each of the dyads, the stronger of the two antagonists does not outwardly acknowledge the competition, making cooperative nuclear risk reduction extremely difficult. Nor do Pakistan and China acknowledge their previous collaboration against India. A triangular effort at nuclear risk reduction would be plagued by this history, and by the lack of symmetry resulting from complex three-cornered interactions.

Triangular or bilateral treaty obligations involving China, India, and Pakistan would be very difficult to negotiate since neither equality nor formalized inequality is likely to be acceptable to one or more parties. Even if treaties were negotiable during the formative and most dangerous phase of their nuclear competition, India, Pakistan, and China do not have the independent, redundant means to monitor treaty obligations, the willingness to accept the transparency necessary for treaty verification, or a true interest in accepting intrusive monitoring by third parties. The role that treaties played in reducing nuclear risks during the Cold War is therefore unlikely to be available to national leaders in China, India, and Pakistan. In this event, stand-alone nuclear risk-reduction arrangements become more essential, but also more difficult, given the absence of trust that verifiable treaty obligations might generate.

National leaders in China, India, and Pakistan have all declared their firm intention not to repeat the nuclear excesses of the United States and Soviet Union. No one expects them to accumulate the liabilities that come with bloated nuclear arsenals. But excessively large nuclear arsenals carried the presumed benefit of providing insurance against a surprise attack, making strategic defeats or preemption improbable. Small nuclear arsenals might not provide that much of an insurance policy, particularly in the risk-laden, early phases of a nuclear competition.

Put another way, limited arsenals might generate risks, rather than guarantee risk reduction. Indeed, the historical record suggests that security concerns have been particularly worrisome to states possessing small nuclear arsenals. This was certainly true for the U.S.–Soviet experience, when nuclear risks were greatest in the early phases of arsenal building, when vulnerabilities were evident, verification weak, and command and control untested. The brief, crisis-filled record since India and Pakistan acquired nuclear capabilities seems to confirm this proposition. If China, India, and Pakistan are to demonstrate a superior wisdom that resists ever-increasing nuclear capabilities, they must first demonstrate a superior wisdom to reduce nuclear risks.

This analysis suggests that nuclear risk reduction will be a far more complex undertaking in southern Asia than was the case for the United States and the Soviet Union. As bad as Cold War nuclear dangers were, bipolarity provided a measure of simplification. The nuclear balance could be codified in treaties predicated on equality. A common understanding of stabilizing and destabilizing activities could also be negotiated. Competition was pervasive, and yet aspects that were most dangerous were placed off-limits. Berlin and Korea were divided, but Washington and Moscow did not exchange artillery fire across these lines. U.S. and Soviet military planning was not predicated on daily, violent interactions.

Conclusion

The United States and the Soviet Union were fortunate to manage their competition without the use of nuclear weapons. Perhaps India, Pakistan,

and China will be similarly lucky, but they would be wise not to depend too heavily on faith, good fortune, or divine protection. It took Washington and Moscow two decades to pass through a dangerous opening phase of nuclear competition to establish treaty-based and less formal risk-reduction arrangements. India, Pakistan, and China are now in this difficult passage, but without the likely prospect of treaties to curtail regional nuclear dangers.

Indian and Pakistani government officials face daunting challenges to reduce nuclear dangers on the Subcontinent. Mutual restraint in nuclear deployments and force sizing are necessary, but insufficient. Nor can national leaders hope to succeed at nuclear risk reduction solely by undertaking unilateral actions to improve command and control and cross-border monitoring. Successful nuclear risk reduction in southern Asia—as was the case for the United States and Soviet Union—requires collaborative as well as unilateral actions.

The rhetorical declarations of peaceful intent and negotiated CBMs that Islamabad and New Delhi have relied upon instead of treaties, provide a completely inadequate basis for nuclear risk reduction. Rhetorical pronouncements have usually been advanced to place "the other" at a political disadvantage.[11] The impulse for negotiating CBMs has usually followed wars or crises on the Subcontinent and waned after a crisis has passed. The subsequent record of existing CBMs—where obligations are initially honored, only to be superceded by unrestrained military practices—hardly builds confidence. In this context, "confidence building" is designed primarily to assuage foreign audiences that leaders in South Asia are capable of managing their differences. But confidence building is not applied in any serious way to military interactions. Existing CBMs could provide a solid foundation for nuclear risk reduction—but only if there is a sea change in Pakistani and Indian implementation practices.

If nuclear risk reduction is treated in the same cavalier, political fashion as confidence building, then Pakistan, India, and China face a rough and dangerous passage. The introduction of overt, offsetting nuclear capabilities and ballistic missiles has clearly increased tensions and risks in the Subcontinent, at least in the short run, as was most evident in the intense, limited war fought in the heights above Kargil in 1999 and in the subsequent war scare in 2002. How long this period of tension and risk extends depends, in large measure, on how serious political leaders are in pursuing an alternative course.

Serious nuclear risk reduction is not possible in the absence of meaningful official dialogue. Since the 1998 nuclear tests, substantive dialogue on nuclear matters between India and Pakistan has been minimal. Given the dismaying history of Indo-Pakistani interactions, it is understandable why New Delhi would believe that a policy to isolate Pakistan's perpetrators of Kargil and supporters of militancy in Kashmir would yield more benefits than a dialogue on nuclear risk reduction. But this policy has not reduced nuclear dangers in southern Asia. Even if subsequent discussions over Kashmir again prove to be barren, it is incumbent upon Indian leaders to try once more to enlist Pakistan's military leaders in collaborative risk-reduction efforts. New Delhi could facilitate greatly such a course by taking new initiatives to

alleviate tensions in Kashmir, especially those generated by Indian security forces and by local police forces.

As Pakistani officials repeatedly declare, nuclear risk reduction is inextricably linked to tensions in Kashmir. But those tensions are also inextricably linked to the transit of militant groups based in Pakistan across the Line of Control (LoC). Escalation control, nuclear risk reduction, and confidence building all begin at the LoC dividing Kashmir. Pakistan's commitment to using the military as an instrument of statecraft has had disastrous effects for Kashmir, for regional stability, for nuclear risk reduction and confidence building—and for Pakistan itself. Those carrying out militant operations often receive logistical, intelligence, and material support from Pakistan's military leadership. Jihadi operations have no chance to pry Kashmir from Indian control, but they have a high probability of isolating Pakistan and weakening its civil and democratic institutions.

Typically, when India and Pakistan have reached an agreement in principle, one or the other side has refused to formalize it, wary of a domestic backlash. This pattern is utterly detrimental to nuclear risk reduction. Near-term agreement on such matters as prior notification and directional constraints on ballistic missile flight tests seem quite possible, given the clear overlap between Indian and Pakistani risk-reduction proposals.[12] Another indicator of seriousness would therefore be for Indian and Pakistani leaders to promise their citizens to refrain from holding risk-reduction measures hostage to favored outcomes in Kashmir. If successfully negotiated, another test of seriousness would be proper, sustained implementation of any agreements reached.

The barriers against nuclear risk reduction between Beijing and New Delhi are much more scalable. They can be reduced further if both capitals pursue with specificity and dispatch applicable measures, rather than engage in a vague and leisurely "strategic dialogue." Serious risk reduction between China and India would be greatly hampered if Beijing's covert support for Pakistan's nuclear and missile programs continues. Even so, a serious dialogue on applicable measures cannot be avoided. Both New Delhi and Beijing are modernizing missiles that place each other's distant cities within cross-hairs. The readiness posture and positioning they choose for these missiles could either increase tensions or alleviate them. Another key manifestation of serious nuclear risk reduction would be concerted actions by New Delhi and Beijing to transform their LoCs into international borders.

Notes

1. An earlier version of this essay was originally published in Michael Krepon, *Nuclear Risk Reduction: Is Cold War Experience Applicable for South Asia?* Report no. 38 (Washington, DC: The Henry L. Stimson Center, June 2001), 1–14.
2. David Rees, *Korea: The Limited War* (New York, NY: St. Martin's Press, 1964), 166–67; Stephen Ambrose, *Eisenhower* (New York, NY: Simon and Schuster 1983), 426; Herbert Brownell with John P. Burke, *Advising Ike* (Lawrence, KS: University of Kansas Press, 1993), 138–39.

3. See Thomas Parrish, *Berlin in the Balance, 1945–1949: The Blockade, the Airlift, the First Major Battle of the Cold War* (Reading, MA: Addison-Wesley, 1998); and W. Phillips Davison, *The Berlin Blockade* (Princeton, NJ: Princeton University Press, 1958).
4. Sovietologist Herbert S. Dinerstein concluded that Soviet missiles were supposed "... to protect Cuba and other progressive regimes" and "to deter a direct U.S. attack on Cuba" in Herbert S. Dinerstein, *The Making of a Missile Crisis: October 1962* (Baltimore, MD: Johns Hopkins University Press, 1978), 186–87.
5. The phrase was coined by James G. Blight and David A. Welch, *On the Brink* (New York, NY: Hill and Wang, 1989), 116. For a similar assessment, see Barton J. Bernstein, "Reconsidering the Missile Crisis: Dealing with the Problems of the American Jupiters in Turkey," in James A. Nathan, *The Cuban Missile Crisis Revisited* (New York, NY: St. Martin's Press, 1992), 65; and Dinerstein, *Making of a Missile Crisis* 186.
6. For a first-person account of the initial inspections, see Don O. Stovall, "The Stockholm Accord: On-Site Inspections in Eastern and Western Europe," in Lewis A. Dunn and Amy E. Gordon, ed., *Arms Control Verification & the New Role of On-Site Inspection* (Lexington, MA: Lexington Books, 1989), 15–39.
7. For an official history of this process, see Joseph P. Hanrahan and John C. Kuhn, III, *On-Site Inspections Under the CFE Treaty, A History of the On-Site Inspection Agency and CFE Treaty Implementation, 1990–1996* (Washington, DC: The On-Site Inspection Agency, U.S. Department of Defense, 1996); see also David Willford, *A Brief History of the On-Site Inspection Agency* (Washington, DC: Department of Defense, 1997).
8. See Barry M. Blechman and Michael Krepon, *Nuclear Risk Reduction Centers* (Washington, DC: Center for Strategic and International Studies, 1986).
9. Essential reading in this regard is Scott D. Sagan, *The Limits of Safety: Organizations, Accidents, and Nuclear Weapons* (Princeton, NJ: Princeton University Press, 1993) and Bruce G. Blair, *The Logic of Accidental Nuclear War* (Washington, DC: The Brookings Institution, 1993).
10. See Peter Vincent Pry, *War Scare* (Atlanta, GA: Turner Publishing, Inc., 1997); Christopher Andrew and Oleg Gordievsky, *KGB: The Inside Story of its Foreign Operations from Lenin to Gorbachev* (London: Hodder and Stoughton, 1990); and "Soviet Capabilities for Strategic Nuclear Conflict, 1983–93," NIE 11–3/8–83 (March 6, 1984) in Donald P. Steury, compiler *(Declassified) Estimates on Soviet Military Power, 1954 to 1984, A Selection* (Washington, DC: Center for the Study of Intelligence, Central Intelligence Agency, 1994).
11. See P.R. Chari, "Declaratory Statements and Confidence-Building in South Asia," in Michael Krepon, Jenny S. Drezin, and Michael Newbill, eds., *Declaratory Diplomacy: Rhetorical Initiatives and Confidence-Building*, Report 27 (Washington, DC: The Henry L. Stimson Center, 1999).
12. See chapter 3 in this book, Chris Gagné, "Nuclear Risk Reduction in South Asia: Building on Common Ground."

2

Nuclear Restraint, Risk Reduction, and the Security–Insecurity Paradox in South Asia

P.R. Chari

The reciprocal nuclear tests by India and Pakistan in May 1998 surprised the world but were hardly unexpected, given their steady progress toward acquiring nuclear capabilities.[1] These tests propelled New Delhi and Islamabad across a nuclear threshold and their subsequent claims to have become nuclear weapon states dramatically altered the South Asian security environment. Their urgent claim to nuclear status made clear that prestige weighed as heavily as security in motivating these nuclear tests. It could be generally observed that domestic and internal political issues have outweighed external security concerns in national security decision making on nuclear disarmament and nonproliferation questions in the last decade,[2] and in the calculations of their "strategic enclaves."[3]

The nuclear tests also raised several troubling questions for the international community, such as the possible diffusion of nuclear technology to neighboring countries and regions. These anxieties were fuelled by the Kargil conflict in mid-1999, a year after the sequential Pokharan and Chagai tests. This crisis "made clear that the new status each [India and Pakistan] claimed did not remove the danger of war, but certainly increased the stakes if war occurred,"[4] a notion that was confirmed during another crisis in India–Pakistan relations that occurred two years later.

This essay contends that the Kargil conflict revealed streaks of both rationality and irrationality by Indian and Pakistani leaders. Systemic factors ensure that this dispensation will continue. Hence, it is by no means axiomatic that another conflict between the two countries is either unthinkable or would be terminated without escalating across the nuclear threshold. This is apparent from developments that occurred during the Kargil conflict, and thereafter during their border confrontation in 2001–2002. A case is then made for both countries observing nuclear restraint and not weaponizing and deploying nuclear devices on purely pragmatic considerations. I argue that pursuing the weaponization and deployment option would

introduce great instability in India–Pakistan bilateral relations. Finally, assuming that weaponization and deployment do take place, I discuss the nuclear risk-reduction measures that could be emplaced.

The Kargil Conflict and the India–Pakistan Standoff, 2001–2002

The Kargil conflict undermined two widely held *a priori* beliefs. First, democracies do not conflict with each other. (The Nawaz Sharif government, then in power, was a civilian establishment, and was asserting itself against the military.) Second, nuclear weapons states do not go to war against each other. (The only other exceptions were the Ussuri clashes between the Soviet Union and China that occurred in March 1969.)

Did the restraint shown by the Indian and Pakistani leadership by not escalating the Kargil conflict to the general war level exhibit their rationality? Should it be assumed that they are no less rational than their counterparts in the other nuclear weapon states? Both questions need to be debated. These questions are also being asked regarding the subsequent dangerous drift in India–Pakistan relations leading to their border confrontation in 2001–2002. The confrontation highlighted the inherent threat of sparking a conventional conflict that could have escalated beyond the nuclear threshold.

It is arguable that nuclear deterrence established by their reciprocal nuclear tests prevented the Kargil conflict's extension from the Kargil–Drass sector to other areas along the Line of Control (LoC) in Kashmir and the international border. This extension of the conflict occurred twice before during the wars in 1965 and 1971. Due to terrain factors, the Kargil conflict was limited to infantry operations, thus restricting weaponry used to small arms and artillery. The Indian Air Force supported the infantry operations, but the Pakistan Air Force was not deployed, which could have escalated the conflict. The effectiveness of the Indian infantry and air operations, however, was greatly reduced by the political direction prohibiting the crossing of the LoC despite the several military disadvantages of this constraint, and the larger casualties that were suffered in consequence. For its part, Pakistan abandoned the intruders after the Indian counterattacks gained momentum, and reinforcing and resupplying them became problematical.[5]

Hence, it could be urged that the two leaderships acted with circumspection after the Kargil conflict erupted and terminated the hostilities in an orderly manner, although American pressure indubitably catalyzed this process. In fact, the belief remains in India that,

> though nuclear weapons in Pakistan are under the control of the army . . . India has no reason to believe that the Pakistani Generals will act less responsibly than the political dispensation . . . when they know clearly that unleashing the nuclear genie will certainly lead to the end of Pakistan as a nation-state, regardless of the damage that India might sustain.[6]

A survival instinct is thus assumed to be informing Pakistan's leadership to refrain from using nuclear weapons.

This thesis has two major flaws. First, the relegation of Pakistan's civilian leadership to the background is out of sync with the zeitgeist that is distinguished by a democratization of national polities. Pakistan's military has acted irrationally in the past, leading the country into disastrous enterprises in 1965 and in 1971, which led to the excision of its eastern wing and the creation of Bangladesh. Its Kargil adventure isolated Pakistan in the international system and has imbued the LoC with a new sanctity. Second, the conclusion that India would launch a devastating riposte to obliterate Pakistan should Pakistan launch a nuclear attack, irrespective of the ravages India might suffer, suggests a certain irrationality afflicting sections of the Indian military, that is, it would derive satisfaction from completely destroying Pakistan irrespective of the consequences for India. Conveying a threat of this nature without wishing to implement it is obviously irrational.

Proceeding further, a streak of irrationality informed the Pakistani leadership to undertake the Kargil intrusions, without war-gaming possible Indian responses, for reasons that seem abstruse in retrospect.[7] Pakistan's leadership might have assessed that its nuclear deterrent would inhibit an Indian military response. This was feckless, but such beliefs have informed Pakistan's conviction that its nuclear capability checkmated India in past crises. Some leading personalities in Pakistan have argued that the "value of nuclear capability was illustrated on at least three occasions."[8] These were in 1984 when India was purportedly contemplating an attack upon Pakistan's nuclear facilities in Kahuta in collusion with Israel; during the Brasstacks Exercise (1986–1987) when India was believed to be planning to convert this exercise into a cross-border operation; and during the April–May 1990 crisis in Kashmir when India was allegedly contemplating air raids on militant training camps in Azad Kashmir. This alacrity to rely on Pakistan's nuclear capabilities during India–Pakistan crises is hardly rational, but that fact has not prevented Pakistan from brandishing the nuclear threat on several occasions including, as we note the Kargil conflict and the later crisis in 2001–2002.

In the future, Pakistan's limited resources would ensure that its conventional inferiority vis-à-vis India would keep widening. Indeed, there are voices in India urging that radical increases in its own defense budget and arms acquisitions would "force a matching response to beggar Pakistan" and hasten its oncoming bankruptcy.[9] In this milieu, Pakistan would increase its dependence on nuclear weapons, since it believes that nuclear weapons compensate for conventional inferiority. Hence, "purely deterrent forces can be relatively modest, provided their survivability can be assured against a surprise attack. . . . Nor does a strategic arsenal have to match the adversary's arsenal. For nuclear weapons are not meant for war fighting. Nuclear deterrence, unlike the conventional one, is not degraded by quantitative or qualitative disparity."[10] The implications of Pakistan's growing conventional inferiority would be greater dependence on nuclear weapons, which is not very reassuring.

Further, the ending of the Kargil conflict in a politico-military disaster did not lead to any moderation in Pakistan's subsequent conduct. On the contrary, incidents of cross-border terrorism increased to include *fidayeen* (suicide) attacks on Indian military and paramilitary forces, installations, and administrative headquarters in Kashmir. The irrationality of this strategy arises from the reality that "allowing the practice of cross-border terrorism to dictate policy effectively legitimizes the behaviour, and Pakistan simply cannot afford to support a policy in Kashmir that if applied within Pakistan's borders would threaten the integrity of the state."[11] Why then is Pakistan continuing with this profitless policy that further disrupts its economy, increases its diplomatic isolation, and exacerbates the socio-political crisis within the country?

This anomaly in Pakistan's strategy became evident when a terrorists' attack on the Indian Parliament on December 13, 2001 precipitated a serious crisis in bilateral relations. Stung by domestic anger and criticism of its "ineptitude," the Indian government deployed a large part of its armed forces along the India–Pakistan border—ostensibly to prevent cross-border terrorism, but in reality to pressure the United States to prevail on Pakistan to refrain from pursuing its intransigent policy. This forced Pakistan to undertake a costly defensive counterdeployment of its armed forces leading to a rapid deterioration in India–Pakistan relations, international alarm, and diplomatic intercession by the United States. Pakistan was coerced into declaring that it would no longer support cross-border terrorism into India and would dismantle the jihadi organizations flourishing in the country, largely with official patronage. Whether President Pervez Musharraf can deliver on these assurances, even over a long time frame, is another matter.

One could argue that Pakistan is now hoist on its own petard. Calling off cross-border terrorism in Kashmir would ensure that militancy within Pakistan intensifies, while continuing to support cross-border terrorism would alienate Pakistan even further internationally whilst heightening its dependence on international financial institutions. It is possible that Pakistan's military rulers, after harnessing the religious extremist groups to support Kargil and subsequent adventures, are unable to restrain them. It is also possible that the Pakistani Army and the Inter-Services Intelligence (ISI) are using the supposed intransigence of the jihadists to continue an increasingly aimless Kashmir policy, while hoping in a serendipitous fashion that international, especially U.S. support would somehow become available. The jury is out on this question, but I agree with the perceptive observation that

> the ultimate outcome of a policy is not what determines its qualification as folly. All misgovernment is contrary to self-interest in the long run, but may actually strengthen a regime. It qualifies as folly when it is perverse persistence in a policy demonstrably unworkable or counter productive.[12]

Thus Pakistan's post-Kargil persistence in its intransigent Kashmir policy against its own national self-interests is irrational, but this policy obviously appears rational to its military rulers.

Similarly, the belief that a limited conventional conflict to meet the cross-border terrorist threat in Kashmir is unavoidable informs important segments of the Indian political and military leadership. As articulated by India's defense minister, George Fernandes,

> Pakistan did hold out a nuclear threat during the Kargil War last year. But it had not absorbed the real meaning of nuclearization; that it can deter only the use of nuclear weapons, but not all and any war . . . [S]o the issue was not that war had been made obsolete by nuclear weapons, and that covert war by proxy was the only option, but that conventional war remained feasible though with definite limitations.[13]

The defense minister extended this logic during the later India–Pakistan crisis when he memorably claimed that: "We [India] could take a strike, survive and then hit back. Pakistan would be finished." [14]

Indian strategists have not been reticent in suggesting the countermeasures that India should undertake in Kashmir. These countermeasures include covert operations within Pakistan using Special Forces, launching attacks across the LoC, undertaking "hot pursuit" across the LoC, and degrading Pakistan's military potential by a war of attrition. A plea was made for "surgical strikes" during the India–Pakistan border confrontation in 2001–2002, implying rapidly executed operations conducted either by "special [commando] forces" or punitive air attacks.[15] The unstated hope has always been that the nuclear threshold would not be crossed, despite the conviction among Indian bomb protagonists that "Pakistan is a 'rogue state,' its leaders are irrational and irresponsible and could not be trusted not to use nuclear weapons, for which India, therefore, had to be 'prepared.' "[16] Indeed, the possibility of an escalation of the India–Pakistan confrontation into a nuclear conflict has been accepted by the admission "we do not know their nuclear threshold. We will retaliate and must be prepared for mutual destruction on both sides."[17] These beliefs and suppositions raise one of the greatest unresolved dilemmas of the nuclear age: How can a conventional, apart from a nuclear, conflict between two nuclear adversaries be fought and graduated to ensure that it would not escalate into a general nuclear war? There is no credible answer to this question. The thesis that limited conventional conflict in a nuclearized environment is feasible is quite irrational. Indian political and military leaders, however, find the limited war option within certain undefined boundaries to be quite rational.

Most importantly, the nuclearized environment in South Asia has not persuaded the leadership in either country to observe restraint in making provocative and inflammatory public declarations. During the Kargil conflict Pakistan's foreign secretary warned that Islamabad could use "any weapon" in its arsenal to defend the country's territorial integrity.[18] During the India– Pakistan border confrontation in 2001–2002, veiled and unvarnished nuclear threats were held out by President Musharraf, Railway Minister Javed Ashraf Qazi, and even Pakistan's permanent representative to the United Nations, Munir Akram.

Indian leaders did not hold out nuclear threats during the Kargil conflict, but were not averse to issuing them freely in the past.[19] As noted earlier, Defense Minister George Fernandes had expressed his confidence during the 2001–2002 India–Pakistan border confrontation that Pakistan would never initiate a nuclear exchange for fear of total annihilation. He added,

> Everyone is raring to go [across the border]. This applies as much to the army as the air force. In fact, something that actually bothers them [Indian military] from the ordinary jawan [soldier] to the mid-level officer to the men at the top is that things might now reach a point where one says there is no war.[20]

It is difficult to dismiss these statements as mere rhetoric only intended for domestic consumption when taking into account the importance of these personages in the governing structures of Pakistan and India. Their irresponsibility, however, is patent, since such utterances have an incendiary content in tense situations. Aggressive statements could, perhaps, be occasioned by the ignorance of the India–Pakistan leadership regarding the destructive potential of nuclear weapons and the dangers of making provocative declarations in a nuclearized environment. Such posturing has strengthened convictions in the international community that Indian and Pakistani leaders seem unable to comprehend that nuclear weapons establish an entirely new context for security relationships in which the need for reassurance and accommodation of the adversary is as significant for the stability of their relationship as the establishment of deterrence. Further, the breakdown of contacts between the two leaderships during the Kargil conflict, as also during the border crisis, and the fact that no dialogue has been revived between them up to the time of this writing, must add to anxieties abroad regarding the stability of South Asia.

Implications for Regional Stability

The Kargil conflict and the subsequent border crisis truly exemplify what is recognized as the "stability–instability" paradox. This holds that

> lowering the probability that a conventional war will escalate to a nuclear war—along preemptive and other lines—reduces the danger of starting a conventional war; thus, this low likelihood of escalation—referred to here as "stability"—makes conventional war less dangerous, and possibly, as a result, more likely.[21]

More simply expressed, the "stability" induced in bilateral adversarial relations by constructing a nuclear deterrent relationship could be offset by the "instability" resulting from the feasibility of conventional war becoming greater. Indeed, nuclear weapons provided the backdrop for the several Cold War confrontations between the superpowers that occurred through their proxies in various theaters like Vietnam and Afghanistan. "The trick," as Paul Bracken noted,

> was to put the burden of escalation on the other side. . . . [I]ronically, having nuclear weapons probably encouraged these low-level torments, precisely by

> ensuring that Americans and Russians would stop just short of shooting at each other.[22]

Hence, the tit-for-tat nuclear tests conducted by India and Pakistan in May 1998 had probably succeeded in making the Kargil conflict possible and providing the umbrella under which their border confrontation could proceed to reach critical levels. This was surely an unintended consequence of the nuclear tests, which were meant to heighten Indian and Pakistani security by deterring nuclear and conventional aggression. The availability of the nuclear deterrent to Pakistan encouraged its undertaking the Kargil intrusions, and exponentially increasing its cross-border terrorism and proxy war in Kashmir. The presence of the nuclear deterrent also seems to inform Pakistan's chimerical policy to incorporate Kashmir into its body politic.

Indeed, the Kargil Review Committee Report notes

> What Pakistan attempted at Kargil was a typical case of salami slicing [*Government Security Deletion*]. Since India did not cross the LoC and reacted strictly within its own territory, the effort to conjure up escalation of a kind that could lead to nuclear war did not succeed. Despite its best efforts Pakistan was unable to link its Kargil caper with a nuclear flashpoint, though some foreign observers believe it was a near thing.[23]

The belief in India that Pakistan deliberately introduced a nuclear element into the Kargil conflict should be a cause for disquiet, but the nuclear threat indubitably informed the restrained countermeasures adopted by India, although, according to one account:

> India then [during the Kargil conflict] activated all its three types of nuclear delivery vehicles and kept them at what is known as Readiness State 3—meaning that some nuclear bombs would be ready to be mated with the delivery vehicle at short notice. The air force was asked to keep its Mirage fighters on stand by. [Defence Research and Development Organization] scientists headed to where the Prithvi missiles were deployed and at least four of them were readied for a possible nuclear strike. Even an Agni missile capable of launching a nuclear warhead was moved to a western Indian state and kept in a state of readiness. . . . [P]akistan too is learnt to have kept its nuclear weapons in an advanced state of readiness.[24]

The authenticity of this account can be questioned, but the absence of any official disclaimer leads to ambiguity that could be intentional but is hardly reassuring. Bruce Reidel, who served on the National Security Council during the Clinton administration, has revealed that U.S. intelligence had developed "disturbing evidence that the Pakistanis were preparing their nuclear arsenals for possible deployment" during the Kargil crisis. More precisely, its military was mounting their intermediate-range missiles with nuclear warheads.[25] Again, there was no official disclaimer from Pakistan, no doubt designed to heighten ambiguities and strengthen the credibility of its deterrent, which is also discomforting.

It was inevitable that India would not tolerate forever with equanimity the low-intensity conflict being encouraged by Pakistan in Kashmir. It was also feckless to assume that Pakistan could engage in this low intensity conflict for years altogether without a larger conflict being precipitated. Such a conflict manifested itself in India's decision to dispatch its armed forces to the India–Pakistan border, ostensibly to halt cross-border terrorism, following the terrorist attack on the Indian Parliament on December 13, 2001. In this milieu the rationality issue could be reviewed at the conceptual level. A mismatch clearly occurs between India's repeated no-first-use declarations, implying a reticence to rely on nuclear weapons, and Pakistan's readiness to use them, should circumstances so require. Further, as eloquently argued by Amartya Sen whilst addressing the troubling question of ensuring the credibility of the nuclear deterrent but averting the danger of its usage:

> [S]ince the effectiveness of these weapons depends ultimately on the willingness to use them in some situations, there is an issue of coherence of thought that has to be addressed here. Implicitly or explicitly an eventuality of actual use has to be a part of the possible alternative scenarios that must be contemplated, if some benefit is to be obtained from the possession and deployment of nuclear weapons. To hold the belief that nuclear weapons are useful but must never be used lacks cogency. . . .[26]

The balance of evidence and logic, as also the inherent anomalies underlying the state of nuclear deterrence, suggests that implicit faith in the rationality of Indian and Pakistani leaders in their ability to optimize the political worth of nuclear weapons is somewhat naïve. The stakes involved in the failure of deterrence, on the other hand, are so enormous that they demand greater attention to the stabilization of the nuclear standoff between India and Pakistan. Therefore, a case is made for negotiating nuclear restraint and risk-reduction measures.

The Case for Nuclear Restraint

The nuclear capabilities established by India after its Pokharan tests require some discussion to assess India's progress toward weaponization and deployment. Officially it was stated

> The three tests conducted on May 11, 1998 were with a fission device with a yield of about 12 [kilotons (kt)], a thermonuclear device with a yield of about 43 kt and a sub-Kilotonne device. All three devices were detonated simultaneously. . . .[O]n May 13, 1998 two more sub-Kilotonne tests were carried out. These devices were also detonated simultaneously. The yields of the sub-Kilotonne devices were in the range of 0.2 to 0.6 kt.[27]

It was further claimed that, "these tests have significantly enhanced our capability in computer simulation of new designs and taken us to the stage of sub-critical experiments in the future, if considered necessary."[28] This

opaque language raises two questions about the need for more tests to weaponize and deploy its nuclear arsenal.

First, was a thermonuclear capability truly demonstrated, or was a boosted fission device exploded? One claim is that the fusion process did not proceed to completion, hence the thermonuclear test failed.[29] Since the radiochemical analysis of the fission–fusion products from the test site has not been disclosed this matter remains unresolved. Whether a thermonuclear device was successfully tested is critical for establishing a triad of nuclear forces—as envisaged in India's draft nuclear doctrine—which has special relevance to establishing a deterrent capability vis-à-vis China. A thermonuclear deterrent is attractive to India's bomb advocates because thermonuclear weapons use less fissile materials, are compact in size, and have improved safety features. Moreover, in view of their immense destructive power, missile inaccuracies become less relevant.[30]

Second, the claim that three sub-kiloton tests have "taken us to the stage of sub-critical experiments" is also questionable. Three tests are too few to provide data for developing new designs. Thus, "while a capability for computer simulation of basic workable weapon designs is not inconceivable after these five tests, the claim of being able to carry out [sub-critical tests] would seem to be an overstatement. . . ."[31] More nuclear tests would definitely be required to design new weapons or manufacture more efficient weapons based on proven designs.

It could be concluded that, apart from the twelve kiloton fission device tested in Pokharan, the other devices tested are weaponizable configurations. But India is still some distance away from weaponizing and deploying its sub-kiloton and thermonuclear weapons. Indubitably, there are accounts that India has already weaponized its fission devices in air-deliverable and missile modes:

- Indian officials informed that by the summer of 1994, "designs for air- and missile-deliverable fission weapons had been completed and their various components extensively tested. In all probability India also had the capability to assemble boosted-fission weapons."[32]
- According to another account, in May 1994, a Mirage-2000 aircraft was used to flight-test and explode "the core assembly [of a gravity fission bomb] with a dummy warhead."[33]
- Further, the delivery of a warhead by a missile was successfully achieved in April 1999 when the Agni-II missile was flight-tested. Apparently, "the bomb team had secretly mounted on its warhead a nuclear weapon assembly system minus the plutonium core to test whether all the systems including the safety locks would work,"[34] and the assembly worked as planned.

Again, there is no official confirmation or denial of these accounts. If accurate, they would suggest that India has the ability to weaponize and deploy nuclear weapons of relevance to deter Pakistan. But, in the absence of longer-range missiles, India's present capabilities are insufficient to deter

China. An "enhanced version" of the Agni-II missile was test-fired recently over a 1,250-mile range, and it was officially stated that, "the flight test results have indicated that the mission objectives were met satisfactorily."[35] However, the Agni-II would need much more flight-testing before the missile could be deployed. (It bears recollection that the short-range Prithvi missile underwent some 16 development and field trials before full confidence could be gained in its reliability.) The Agni-II missile would cover the whole of Pakistan, but not reach lucrative targets in China. Basing Agni-II missiles on the Sino-Indian border would increase their vulnerability to attack, but basing them deeper within India would reduce their range against Chinese targets. Ideally, a 5,000–6,000 km range missile is required to deter China, which cannot be deployed without extensive flight testing. More warhead testing would be unavoidable if India wishes to deploy the nuclear triad visualized in its draft nuclear doctrine. Clearly, a submarine force, essential for deriving an assured survivable deterrent capability, cannot be deployed without extensive subsurface testing of warheads and missiles.

The above argues that, on purely technological considerations, further development of India's nuclear warhead and missile capabilities is unavoidable to establish nuclear forces that could deter China apart from Pakistan. This raises the issue of conducting more nuclear and missile tests to derive nuclear weapons capable of deterring China despite international opposition, the likelihood of prejudicing Indo-U.S. relations, and risking a reimposition of the sanctions regime.

Non-Weaponization and Non-Deployment

The nuclear tests in May 1998 make it abundantly clear that India and Pakistan are unlikely to roll back or eliminate their nuclear capabilities. No doubt, it is arguable that proceeding in this fashion like Brazil and Argentina would mitigate the nuclear danger to themselves. It would also halt an incipient three-cornered nuclear arms race in which India would establish a credible deterrent against China, which would cause disquiet in Pakistan and lead to nuclear arsenals being added to and made more sophisticated all around.

But, is it politically likely that India or Pakistan would roll back and eliminate their nuclear capabilities? India's search for nuclear status is traceable to the 1960s after China, which remains India's primary focus, exploded its first nuclear device in 1964. Pakistan's quest for nuclear weapons goes back to 1972 and its traumatic defeat by India in the war of 1971, which led to the excision of Pakistan's eastern wing and the creation of Bangladesh. Both countries have crept along over the intervening years to derive nuclear capabilities, which has resulted in established constituencies in favor of weaponization and deployment. It is highly improbable, therefore, that Indian and Pakistani leaders would retreat from the nuclear plateau they have reached. The Clinton administration had, in fact, during its last years abandoned its "cap, rollback, and eventually eliminate" nuclear policy toward South Asia in favor of the more modest goal of capping these capabilities.

Empirical evidence suggests that the early years of a nuclear adversarial relationship are prone to nuclear crisis. In the case of the United States and the Soviet Union, these crises included Berlin (1948), Korea (1952), Vietnam (1954), Taiwan (1956), Berlin (1961), and the Cuban Missile Crisis (1962). Indeed, they "were all serious enough for American field commanders to ask the White House for permission to ready atomic weapons."[36] The Ussuri clashes occurred between the Soviet Union and China in early 1969, during which a nuclear threat was brandished by the Soviets. The Kargil conflict provides another example of this phenomenon—and Kargil has not been the last crisis in India–Pakistan relations as their long, drawn out border confrontation has illustrated. The need, therefore, for nuclear restraint in weaponizing and deploying their nuclear devices, and for nuclear risk-reduction measures if that fails, cannot be overemphasized.

The logic of weaponizing and deploying India's nuclear arsenal should be noted before the counterarguments are presented. Some definitions are needed here.

> . . . [W] eaponization can be thought of as the process of developing, testing, and integrating warhead components into a militarily usable weapon system. Deployment can be defined as the process of transferring bombs or warheads to military units for storage and rapid mating with delivery systems at military bases.[37]

Further, a nuclear deterrent force must meet several requirements including: the ability to survive a first strike; delivery systems capable of reaching their targets after penetrating adversary defenses; a low risk of physical accidents; safeguards against theft or unauthorized use; a low risk of mistaken use by authorized persons; command authorities that survive a first strike; a variety of response options; and affordability.[38]

The crucial parameter for weaponization is the availability of a "militarily usable weapon system" which, as argued earlier, may be available to India and Pakistan with relevance to each other, but not for India vis-à-vis China. Besides, apart from the transference of such "militarily usable weapon systems" to military depots, the South Asian tradition requires their incorporation into tactical doctrine and inclusion in training schedules. Above all, there is a need for the establishment of a credible command and control system. These steps have not been taken. It could be urged that deterrence requires both transparency and opacity, hence creating some uncertainty regarding command and control strengthens deterrence. But this is an altogether unsatisfactory basis for premising the last resort option.

The arguments for proceeding to weaponize and deploy nuclear weapons can now be rehearsed. This would crown the logic of the nuclear tests and lend credence to the deterrent. Further, assuming that nuclear weapons also serve political objectives, their value lies in deploying them, rather than assembling them during crises. This factor has been stressed by some analysts in India who have criticized New Delhi's earlier reliance on non-weaponized deterrence as not being credible.

Three other factors support a weaponized and deployed posture. The arguments for and against them can be marshaled. To begin with, weaponization and deployment of nuclear devices and the acquisition of assured second-strike capabilities would stabilize India–Pakistan relations. Conversely, non-weaponization and non-deployment would be destabilizing due to the inherent uncertainties. The concept of non-weaponized or recessed deterrence has been criticized on the grounds that it

> does not differentiate between first and second strike, between vulnerable and invulnerable arsenals, and between maintaining the stability of the status quo and the disadvantages of disturbing it.[39]

Weaponizing arsenals in a crisis, moreover, could engender misperceptions and instability.

It could be argued on the contrary that the non-weaponized nuclear deterrent posture adopted by India and Pakistan in the 1980s, as noted earlier, helped to avert three major bilateral crises from escalating. This deterrent posture was strengthened after the nuclear tests as evident from the mutual restraint exhibited by the two countries in the Kargil conflict. Neither country enlarged the dimensions of that conflict by opening other fronts and utilizing more destructive weapons like armor, fighter bombers, or naval vessels. In this situation, it is arguable that weaponizing and deploying nuclear capabilities will not result in a more stable deterrence. However, proceeding to an overt deployed status would exacerbate the dilemmas arising from India's declared no-first-use policy and its desire to establish a minimum nuclear deterrent force.[40] It would also be destabilizing for five reasons lying partly in the systemic factors distinguishing South Asia and partly in factors lying embedded in the nuclear situation.

First, having identified the need for a triad to establish survivable nuclear forces, India's ultimate objective would be the acquisition of nuclear missile-armed nuclear submarines, regardless of the time and cost considerations involved. Declarations that only a minimum deterrent force would be deployed would not carry any weight with constituencies like the defense scientists and armed forces that have an interest in qualitatively advanced weapon systems being developed and deployed. Inter-service rivalries would also propel this qualitative arms race onwards, as has occurred in the other nuclear weapon powers.

Second, once deployment starts, the adherence to minimum force levels would also be forgotten, as past experience indicates. Considerations of sufficiency would dictate the size of nuclear arsenals, since the bilateral India–Pakistan nuclear standoff would convert into a three-party China–India–Pakistan asymmetry. A decision by one party to increase its nuclear forces would cause anxieties in the others, leading to a three-way quantitative arms race. Routine statements would, of course, be made that such actions are purely defensive and meant to replace obsolete weapon systems and are not being influenced by inimical motives.

Third, the smaller the minimum deterrent force, the greater the problem of ensuring its survivability from external attack and internal sabotage. Locating them in one or two storage centers would increase the difficulty of ensuring their survival. But dispersing them over several sites and separating the warheads from their delivery vehicles would greatly compound the problems of failsafe communications, especially in a nuclear conflict scenario in which electromagnetic pulse effects would disrupt communications. The dual requirements of survivability and dispersal skew the argument in favor of larger nuclear forces than are strictly warranted by a minimum deterrent posture.

Fourth, the need would arise to decide whether a countercity or counterforce strategy should be pursued. A targeting policy that consciously focuses on cities would be morally repugnant since it shades over the differences between combatants and noncombatants. Such a policy would also contradict India's earlier offer to Pakistan of extending the agreement on nonattack of nuclear installations and facilities to cities and large economic centers.[41] Pursuing a counterforce strategy, on the other hand, requires the deployment of tactical nuclear weapons and a war-fighting strategy; this has its consequential dangers of uncontrollable escalation to general nuclear war. It would also require resolution as to whether a launch-on-warning or launch-under-attack posture would be viable, given the extremely short flight-times for aircraft and missiles between India and Pakistan. Given its greater vulnerabilities, it is likely that Pakistan would opt for a hair-trigger, launch-on-warning nuclear posture, which would add quantum measures to the danger of accidental conflict. These are dilemmas that lie at the heart of the nuclear condition, and have never been resolved.

Fifth, South Asia remains a well-recognized accident-prone region. Accidents involving fires and explosions in arms depots, including missile manufacturing units, are not uncommon. For that matter, India's nuclear program has also witnessed several accidents.[42] To suggest that its nuclear weapons sites will remain accident free would be fatuous, but their possible consequences would be horrendous. Indeed, the draft nuclear doctrine envisages a need for disaster control, which is very disconcerting,[43] and points to the risks attendant upon weaponization and deployment. This is quite apart from the dangers of misperception, miscalculation, leadership irrationality, unauthorized or inadvertent use, and the like, inherent in a deployed nuclear posture.

In these circumstances, a decision by India and Pakistan to weaponize and deploy their nuclear weapons would be counterproductive for symmetrical reasons. Additionally, a decision by India to deploy only against Pakistan but not against China would be illogical. It would only ensure that China would target India without the latter being able to do the same. Thus, India could obtain some domestic political gains, but no commensurate strategic advantage against China by deploying its nuclear weapons.

It could be urged here that the deployment of mobile missiles would be stabilizing since their detection is very difficult, which ensures their survivability and availability for a second strike. Mobile missiles are comparable in

deterrent value to nuclear missile armed nuclear submarines that are virtually undetectable. There are two arguments, however, against deploying mobile missiles in the context of weaponization and deployment of nuclear weapons in South Asia.

First, a road- or rail-mobile system would be expensive and would require a large unpopulated area of the country, which may not be easy to locate. Besides, given the condition of the roads in South Asia and the accident record of the railways, the likelihood of mobile missiles becoming a menace to the country deploying them cannot be ruled out. There is also the problem of their location being compromised after some time due to "repetitive surveillance, human intelligence, and the disclosure of underground shelters in peacetime alerting exercises."[44]

Second, deploying mobile missiles would greatly compound the problems of command and control. Communicating with mobile missile batteries on the move would be no less difficult than with submerged nuclear missile armed submarines. Furthermore, in the interests of keeping their location secret, all communications would need to be reduced to an absolute minimum, which suggests greater delegation of release authority to the battery commanders. The dangers of accident, misperception and unauthorized use increase exponentially in such a dispensation, especially in the absence of credible early warning systems and adequate command and control mechanisms. Thus, deploying mobile missiles would add quantum measures to instability between India and Pakistan rather than stability.

How could non-weaponization and non-deployment be credibly verified? This is a challenging question, and it must be readily conceded that no foolproof system exists to assuage doubts that weaponization has not taken place surreptitiously. Much depends, naturally, on the faith of a country in the efficacy of its non-weaponized nuclear devices and its conviction that they would function as intended whenever required. Within limits, the deployment of weaponized devices could be verified if they are located in storage depots, transferred to operational sites, or utilized in training exercises. However, separation of bombs and warheads from their delivery systems would greatly complicate verification. The only certain modality for verifying that weaponization and deployment has not occurred would be by intrusive means such as placing surveillance equipment in relevant establishments along the lines of the safeguards arrangements made by the International Atomic Energy Agency (IAEA) to monitor nuclear facilities and installations. This requires a level of trust between India and Pakistan that does not exist and may not exist in the future. Lest this provide cold comfort, it would be instructive to recollect that estimates of warhead numbers and delivery systems, such as cruise missiles and tactical nuclear weapons, have never been wholly reassuring. It would be feckless to assume consequently that the verification of a non-weaponized and non-deployed nuclear posture is possible without a modicum of trust between the two countries. Still, the question does arise whether it would be preferable to adopt a non-weaponized posture that is not fully verifiable, or to weaponize and deploy nuclear weapons with their attendant problems and dangers.

The arguments in favor of non-deployment can now be summarized. The need for nuclear stability in South Asia is paramount, particularly in the obtaining situation where no communication exists between the two leaderships. The deployment of nuclear weapons could destabilize this fragile bilateral relationship, especially in the absence of early warning and command and control systems. Besides, the precise extent of the involvement of the Indian armed forces in nuclear decision making is not clear, although the belief obtains that

> the nuclear devices remain in the possession of the scientists, suggesting that their mating with delivery vehicles would only be effected when deemed essential. Whether this is desirable in peacetime or feasible in an emergency or during an actual conflict is an aspect of the weaponization and deployment option that has never been seriously addressed.[45]

There are proposals for appointing a chief of defense staff to exercise operational control over the Indian nuclear forces. This personage is yet to be appointed; meanwhile a truncated, integrated structure functions under a vice chief of defense staff. It remains unclear however, what his relations will be with the three service chiefs or the prime minister who would exercise release authority, and which custodial agency will have physical possession of the nuclear arsenal.

In view of these several uncertainties, India could pause and refrain from weaponizing and deploying its nuclear devices. Weaponization and deployment would degrade, rather than enhance, India's national security because Pakistan would assuredly follow suit, linkages between China and Pakistan would further encrust, and China would, most likely, target India with its nuclear missiles. More importantly, India would find itself isolated afresh in the international system. Currently, the rigors of the sanctions imposed upon it after the nuclear tests have been considerably eased by the Bush administration.

The United States had concluded in the last years of the Clinton era that neither India nor Pakistan were "going to give up their nuclear weapons," although greater sanguinity obtained that both countries were not "on the brink of nuclear war over the Kashmir issue," despite "concern about their nuclear missile production."[46] The Bush administration has widened this policy framework to seek a strategic relationship with India using the instrumentalities of increased technology transfers and the lifting of economic sanctions. Indeed, the punitive sanctions levied against India under the Glenn Amendment after New Delhi's May 1998 nuclear tests have since been fully lifted.[47] For its part, India maintains its unilateral moratorium on further nuclear testing, adheres scrupulously by its export control regulations, would reconsider signing the Comprehensive Test Ban Treaty (CTBT) if it is ratified by prominent holdouts like the United States, and has agreed to participate in the Fissile Material Cut-Off Treaty (FMCT) negotiations at the Conference on Disarmament in Geneva.[48] An area of dispute had emerged due to India seeking to improve its missile capabilities by periodical

flight-testing, but it seems to have been papered over by tacit agreement. Convinced that the Kashmir issue lies at the heart of India–Pakistan tensions and instabilities, the United States has also decided to intervene more directly into their bilateral dispute and "facilitate" a solution to this vexed problem.[49]

Clearly, India and Pakistan now face the invidious choice of whether to proceed ahead with the logic of their nuclear tests to weaponize and deploy their nuclear weapons or observe nuclear restraint after having reached a new plateau in their nuclear capabilities. Proceeding further would prejudice their security and isolate them afresh in the international community, which has become greatly concerned with the propensity of both countries to slide into recurring crises that could escalate into conflict and acquire a nuclear dimension. Not weaponizing and deploying their nuclear weapons would leave India especially with an imperfect deterrent and no credible nuclear capabilities against China. Should a decision, nevertheless, be taken to weaponize and deploy their nuclear weapons, several risk-reduction measures could be contemplated. They are discussed below.

Risk-Reduction Measures

A margin of both nuclear restraint and risk reduction is available to India and Pakistan if their nuclear warheads are not mated with their delivery systems, but kept in different locations. Apart from the operational problems noticed above in pursuing this modality, there would be difficulty in verifying whether this deployment pattern is continuing. Intrusive inspection would be anathema, hence it would be naïve to suggest this verification procedure. Could mechanical or electronic means be used for verification? This requires a level of mutual trust and confidence obtaining between India and Pakistan, which, realistically, does not exist and may not exist in the foreseeable future.

India and Pakistan could unilaterally pursue other risk-reduction measures at this stage when their nuclear capabilities have not matured, despite the absence of a dialogue. Some are included in the Memorandum of Understanding (MoU) that accompanied the ill-fated Lahore Declaration. The MoU enjoined the two countries "to provide each other with advance notification in respect of ballistic missile flight tests," "abide by their respective unilateral moratorium on conducting further nuclear test explosions," "undertake a review of the existing communication links . . . with a view to upgrading and improving these links and to provide for fail-safe and secure communications," and to "undertake national measures to [*sic*] reducing the risks of accidental or unauthorized use of nuclear weapons under their respective control."[50]

Should the dialogue process between the two countries be revived, the other measures listed in the MoU could be pursued. They envisage concluding "an agreement on prevention of incidents at sea," setting up "appropriate consultative mechanisms to monitor and ensure effective implementation of these [negotiated] CBMs," and engaging in "bilateral consultations on security, disarmament and nonproliferation issues." In my view, the most

urgent item on this agenda is their engagement in "bilateral consultations on security, disarmament and nonproliferation issues" to negotiate confidence-building measures aimed at avoiding conflict. The sub-items in this agenda could be:

- Agreement on how their nuclear capabilities could be structured for deterrent purposes, but not war fighting. War fighting, for instance, requires tactical nuclear weapons that would be very destabilizing in the subcontinental scenario. Attention might be drawn here to reports that Pakistan has come into possession of tactical nuclear weapons that could be used as battlefield weapons in an India–Pakistan conflict, although there is some healthy skepticism also obtaining in this regard.[51]
- "The need for a common language to understand each other's signaling, such as sounding different states of alert in an emergency, is of supreme importance to defuse future crises and avoid conflict."[52]
- The question of some agreement being reached on what impermissible action(s) would invoke a nuclear response. Apparently, in Pakistan, "the assumption has been that if the enemy launches a general war and undertakes a piercing attack threatening to occupy large territory or communication functions, the 'weapon of last resort' would have to be invoked."[53] India has not clarified what it considers impermissible actions. A degree of opacity no doubt strengthens the deterrent, but the complete lack of transparency about red lines that must not be transgressed could lead to serious misperceptions and miscalculations, especially in a milieu where limited war is deemed to be a feasible proposition.
- Most importantly, the need for appreciating the reality of nuclear asymmetry would have to be accepted to avoid nuclear arms racing. Pakistan must accept the fact that India's nuclear capability has to be designed against Pakistan and China, just as India would have to accept that China's nuclear capability must configure the United States and Russia into its force-structuring exercises. Strict parity in these bilateral deterrent relationships would be unrealistic in the light of their differing security perceptions, and seeking this goal could lead to an unrestrained arms race.

Whilst conceding the incomparability of the American–Soviet case and the India–China–Pakistan triangular relationship, Michael Krepon believes that the superpower experience is of value for South Asia.[54] This experience included

- A formal agreement not to change the *status quo*, for example the Helsinki Accord (1975). The Simla Agreement and the Lahore Declaration provide similar models that need to be operationalized with greater seriousness.
- A tacit agreement to avoid brinkmanship. Kargil embodied the efforts by Pakistan to use its deterrent to achieve its geostrategic objectives in a territorial dispute. Negative statements by Indian and Pakistani leaders escalate bilateral crises and constitute a form of verbal brinkmanship. Such statements are designed for domestic audiences, but should be avoided.

- A formal agreement to minimize or avoid dangerous military exercises. An agreement exists in the India–Pakistan context prohibiting military aircraft from flying within specified distances of the border, which is generally being observed. An agreement to prevent incidents at sea involving naval vessels is envisaged in the MoU that accompanied the Lahore Declaration.
- The prior notification of missile launches. This was also catered for in the MoU, and the agreement was envisaged to be converted into a treaty.
- Trust in the faithful implementation of treaty obligations and confidence-building measures. The key element of trust is missing in the India–Pakistan situation. One example would be the use of hotlines to convey misleading information or their disuse in crisis situations.
- Reliance on one's own monitoring capabilities largely premised on "national technical means." This is currently beyond the capabilities of India and Pakistan, but could become available to India within its ambitious space research program.
- Establishing reliable and redundant command and control arrangements. This, too, was included in the MoU. Little is known in the public domain about what arrangements are available or are being contemplated by the two countries. Except for some discussion on having a secure National Command Authority and National Command Post and identifying the authority to take ultimate decisions on nuclear war and peace issues, there is little visibility about present or future command, control, communication, and intelligence arrangements.
- Upgrade and strengthen existing risk-reduction measures in quiet times and after crises. This is unexceptional advice for all adversarial countries.

Several other ameliorative measures could be contemplated. They include the establishment of risk-reduction centers manned by mixed groups of officials from both sides to defuse crises before they erupt, exchanging information on national steps to ensure safety and security of nuclear stockpiles, establishing hotlines between the two Air Forces and nuclear establishments, and taking mutual steps to mitigate the likelihood of accidental war.

Undoubtedly, the most significant measure of risk reduction would be the resolution of the Kashmir dispute, which hangs over India–Pakistan relations like the proverbial albatross. Pakistan considers Kashmir to be the "core issue" and the "principle" in contention. However, there is also the belief that "the threat is not Kashmir alone. The threat goes a little beyond and that there is [*sic*] domination of Pakistan as desired by India . . . to dominate its economy and its foreign policy."[55] The significance of Kashmir for India also arises from the "principle" that it vindicates its secular foundations. India has expended too much blood and treasure for half a century over Kashmir to concede its incorporation into Pakistan. The tragedy is that while India and Pakistan quarrel, it is the Kashmiri population that suffers. Apart from the loss of life and property, Kashmiris have acquired a permanent sense of psychological insecurity. With the rigid positions adopted by both sides, and peace initiatives such as ceasefires being pursued for largely cosmetic

purposes, Kashmir would remain the epicenter of the India–Pakistan adversarial relationship with the potential to trigger armed conflicts. It would be unrealistic to imagine that the Kashmir dispute would yield to either an easy or early solution, unless India and Pakistan are able to make the compromises needed to reach an agreement on this vexed dispute. This was reconfirmed during the Agra Summit meeting between Prime Minister Vajpayee and President Musharraf in July 2001, when the cessation of cross-border terrorism into Kashmir by Pakistan became the single contentious issue that led to the Summit's failure. Again, the cross-border terrorism issue was largely responsible for triggering the border confrontation in 2001–2002.

Conclusion

The above discussion has argued that the greatest measure of nuclear restraint by India and Pakistan would be not to weaponize and deploy their nuclear devices. India cannot weaponize or deploy its nuclear weapons against China without further warhead and missile testing. The space, therefore, exists for pausing on the nuclear path. A realistic assessment of their national security threats would reveal, moreover, that their problems lie in the internal sphere. These internal problems include the proxy war in Kashmir, ethno-nationalist insurgencies in Northeast India, the chaos in Karachi, unbridled drug and arms trafficking in Pakistan, socio-economic, socio-religious, sectarian, and caste conflict in several parts of the two countries, and, most particularly, the crisis of governance and the criminalization of politics that is hollowing out the Indian and Pakistani polities from within. Nuclear weapons provide no real answer for this range of security threats, yet this lesson remains unlearnt. Nor has the wisdom accrued that nuclear weapons serve the limited purpose of deterring nuclear weapons, and nothing more.

Greater reflection would also reveal the latent dangers of nuclear weapons that arise from accidents, misperceptions, or miscalculations. It would be naïve to believe that the leaders in India and Pakistan are gifted with some special qualities to act wisely in crisis situations, when the "fog of war" creates grave uncertainties for the decision-making apparatus. The history of the nuclear age also provides several examples of leadership irrationality in adversarial dyadic situations, as existed between the United States and the Soviet Union and between the Soviet Union and China. These bilateral interactions had an element of simplicity compared to the triadic relationship that has evolved between India, Pakistan, and China. No precedents or past experiences exist to guide mutual relations in a triadic situation. The learning process would need to proceed with nuclear weapons providing the backdrop. These are further reasons for India and Pakistan to pause and not proceed further with their weaponization and deployment plans.

The issue of weaponizing and deploying India's nuclear capabilities currently lies recessed in the Indian consciousness and there is no great pressure for proceeding further in this direction. There is little to suggest that the situation is different in Pakistan. Both nations are aware of the international

implications and repercussions of taking these steps and the sanctions regimes they would encounter. It is therefore likely that they will maintain their nuclear posture of not rolling back, but improving their nuclear capabilities by computer simulation and laboratory testing without resorting to field-testing their warheads. However, occasional flight tests of missiles would probably continue.

It is conceivable that they would, in the fullness of time, overtly weaponize and deploy their nuclear devices. The precipitating events could be: a credible nuclear threat during an external crisis, which was entirely possible during the long border confrontation between their armed forces in 2001–2002; the supervening imperatives of domestic politics; or developments in the international system like the deployment of a national missile defense system by the United States, heightening a permissive proliferation ethos. Should that happen, China might augment its nuclear forces to counter the American missile shield and assure itself of a second-strike capability. This could have a catalytic effect on India, which might feel compelled to weaponize and deploy its nuclear weapons, forcing Pakistan to do the same.

Risk reduction and confidence building would then become imperative. Existing confidence-building measures would need consolidation to avoid conventional conflict, since both nonnuclear and nuclear conflict lie along a continuum. Indeed, the most likely scenario for a nuclear exchange in South Asia arises from a sub-conventional conflict leading to a conventional conflict that gets out of hand, rather than a bolt-from-the-blue nuclear attack. In the India–Pakistan context, the lack of mutual trust lies at the heart of their difficulties to enter and sustain confidence-building measures. The entrance of the nuclear genie into South Asia should persuade Indian and Pakistani leaders to establish a modicum of trust to stabilize their adversarial relations and not propel the two countries into the nuclear abyss.

Notes

1. An earlier version of this essay was originally published in P.R. Chari, *Nuclear Restraint, Nuclear Risk Reduction and the Security–Insecurity Paradox in South Asia*, report no. 38 (Washington, DC: The Henry L. Stimson Center, June 2001), 15–36.
2. George Perkovich, *India's Nuclear Bomb: The Impact on Global Proliferation* (New Delhi: Oxford University Press, 1999), 446–55. Perkovich argues that India's decision to pursue its military nuclear option was largely influenced by internal and political motivations. I would suggest that powerful domestic, indeed personal, factors were also observable in the American debate leading to rejection of the (CTBT's) ratification by the U.S. Senate in 1999. Domestic political factors were similarly paramount in the Indian debate on rejecting entry into the CTBT. In these cases, the security implications of the decision became secondary factors.
3. An expression attributed to Itty Abraham. He describes it in "India's 'Strategic Enclave': Civilian Scientists and Military Technologies," *Armed Forces and Society* 18, no. 2 (Winter 1992): 233 as "a subset of the Indian military-security complex—specifically, the set of research establishments and production facilities

that are responsible for the development of these new programs." More broadly perceived, the "strategic enclave" comprises an inchoate collection of retired civil and military officials, media persons belonging to the genre of defense correspondents, right-wing politicians, and scientists in the nuclear and defense establishments. What binds them together is a common faith in the pursuit of a militaristic approach to national security, a "realist" foreign policy, and the value of nuclear weapons. In truth, "strategic enclaves" can be found in all countries.

4. Neil Joeck, "Nuclear Relations in South Asia," in Joseph Cirincione, ed., *Repairing the Regime: Preventing the Spread of Weapons of Mass Destruction* (Washington, DC: Carnegie Endowment for International Peace, 2000), 1.
5. Several books have been written in India on the Kargil conflict. Also see Maj. Gen. Ashok Krishna and P.R. Chari, eds., *Kargil: The Tables Turned* (New Delhi: Manohar, 2001) written by the staff of the Institute of Peace and Conflict Studies.
6. Gurmeet Kanwal, "India's National Security Strategy in a Nuclear Environment," *Strategic Analysis* xxiv, no. 9 (December 2000): 1600.
7. These include, according to press analyses and academic speculation, disrupting communications between Srinagar and Leh, internationalizing the Kashmir dispute, deflecting internal discontent with the economic and socio-political conditions in Pakistan, and "defreezing" the *status quo* situation relating to the LoC in Kashmir that was acquiring permanence, etc.
8. Agha Shahi, Zulfiqar Ali Khan, and Abdul Sattar, "Securing Nuclear Peace," *News International* (Pakistan), Internet Edition (October 5, 1999).
9. Vishal Thapar and Anita Kanungo, "What Should We Do With Pakistan," *Hindustan Times Overview* (India) (July 10, 1999). This article was based on a survey in which New Delhi's strategic community was polled.
10. Ibid., 3.
11. Joeck, "Nuclear Relations in South Asia," 8.
12. Barbara W. Tuchmann, *The March of Folly: From Troy to Vietnam* (New York: Alfred A. Knopf, 1984), 33.
13. George Fernandes, "Opening Address," in Air Commodore Jasjit Singh, ed., *Asia's New Dawn: The Challenges to Peace and Security* (New Delhi: Knowledge World, 2000), xvii.
14. "India Could Take a Strike and Survive, Pakistan Won't: Fernandes," *Hindustan Times* (India) (December 30, 2001).
15. This was suggested by India's Defense Secretary, Yogendra Narain in an interview evocatively entitled "A Surgical Strike is the Answer," *Outlook* (India) (June 10, 2002).
16. Praful Bidwai and Achin Vanaik, *South Asia on a Short Fuse: Nuclear Politics and the Future of Global Disarmament* (New Delhi: Oxford University Press, 1999), xi.
17. "India Could Take a Strike and Survive," *Hindustan Times* (India).
18. "Any Weapon Will be Used, Threatens Pak.," the *Hindu* (India) (June 1, 1999).
19. For example, Home Minister Advani, immediately after India's nuclear tests, declared that this "decisive step to become a nuclear weapon state has brought a qualitatively new stage in India–Pakistan relations, particularly in finding a lasting solution to the Kashmir problem." the *Hindu* (India) (May 19, 1998).
20. "India Could Take a Strike and Survive," *Hindustan Times* (India).
21. Charles L. Glaser, *Analyzing Strategic Nuclear Policy* (Princeton, NJ: Princeton University Press, 1990), 46, fn. 69. The author cites T.C. Schelling, "Comment," in Knorr and Read, eds., *Limited Strategic War*, 250–53; Glenn H. Snyder, "The Balance of Power and the Balance of Terror," in Paul Seabury,

ed., *The Balance of Power* (San Francisco: Chandler, 1965), 184–201; and Robert Jervis's discussion of the "stability–instability" paradox in *The Illogic of Amercian Nuclear Strategy* (Ithaca, NY: Cornell University Press, 1984).

22. Paul Bracken, *Fire in the East: The Rise of Asian Military Power and the Second Nuclear Age* (New Delhi: Harper Collins Publishers India Pvt. Ltd., 1999), 103.
23. *Kargil Review Committee Report* (December 15, 1999), para. 13.57 (mimeo). The Committee, though not constituted under the Commissions of Inquiry Act, "was given the widest possible access to all relevant documents, including those with the highest classification and to officials of the Union and Jammu and Kashmir Governments."
24. Raj Chengappa, *Weapons of Peace: The Secret Story of India's Quest to be a Nuclear Power* (New Delhi: Harper Collins Publishers India, 2000), 437. The author informs us that he "had conducted close to two hundred interviews with a range of the key people involved that included former prime ministers, presidents, ministers, generals, secretaries to government, diplomats, strategists and the scores of scientists both known and unknown."
25. Alan Sipress and Thomas Ricks, "Report: India, Pakistan Were Near Nuclear War in 1999," *Washington Post* (May 15, 2000).
26. "India and the Bomb," *Frontline* (India) (September 29, 2000). Based on the first Dorothy Hodgkin Lecture at the Annual Pugwash conference in Cambridge, UK, on August 8, 2000.
27. "Joint Statement by the Chairman of the Atomic Energy Commission and the Scientific Adviser to the Defense Minister," the *Hindu* (India) (May 18, 1998).
28. Ibid.
29. Perkovich, *India's Nuclear Bomb*, 426–27.
30. These and similar arguments have been made in Bharat Karnad, "A Thermonuclear Deterrent," in Amitabh Mattoo, ed., *India's Nuclear Deterrent: Pokharan II and Beyond* (New Delhi: Har-Anand Publications Pvt.Ltd., 1999).
31. R. Ramachandran, "Pokaran II: The Scientific Dimensions," in Amitabh Mattoo, ed., *India's Nuclear Deterrent*, 54.
32. George Perkovich, *The Indian Bomb*, 23, based on interviews.
33. Chengappa, *Weapons of Peace,* 383–84.
34. Ibid., 436.
35. "India Tests Enhanced Version of Missile," *Washington Post* (January 18, 2001).
36. Bracken, *Fire in the East*, 100.
37. Joeck, "Nuclear Relations in South Asia," 4.
38. Gregory S. Jones, "From Testing to Deploying Nuclear Forces: The Hard Choices Facing India and Pakistan," RAND IP 192 (Washington, DC: RAND, 2000), Internet: http://www.rand.org/publications/IP/IP192/index.html.
39. Rear Admiral Raja Menon, *A Nuclear Strategy for India* (New Delhi: Sage Publications, 2000), 173.
40. These and other policy formulations may be found in the [Indian] Prime Minister's Statement in Parliament on December 15, 1998 entitled "Bilateral Talks with the United States," *IPCS Newsletter* (February 1999), 10–11.
41. This proposal was contained in an exchange of "non-papers" between India and Pakistan that occurred in early 1994. For a factual account of this process see USIS Official Text, Third Report to Congress: Update on Progress Toward Regional Non-Proliferation in South Asia (April 19, 1994), 8–10.
42. These accidents have included "collapse during construction of a containment dome at Kaiga, a serious fire at Narora, exposure of 350 workers at Tarapur to

radiation exceeding five rems (current limit two rems), leaks from pipes in waste-storage facilities, exposure to plutonium at Trombay, and to ultra-toxic tritium at Rajasthan. . . ." Cf. Praful Bidwai, "Nuclear Meltdown: Fuelling fears over Foreign Entry," *Times of India* (February 28, 1997).

43. Section 6.3 states, "Disaster Control: India shall develop an appropriate disaster control system capable of handling the unique requirements of potential incidents involving nuclear weapons and materials." Text of the draft Nuclear Doctrine (August 17, 1999), Internet: http://www.meadev.gov.in/govt/indnucld.htm.
44. Rear Admiral Raja Menon, *A Nuclear Strategy for India* (New Delhi: Sage Publications, 2000), 223.
45. P.R. Chari, "India's Slow-Motion Nuclear Deployment," *Carnegie Endowment for International Peace: Proliferation Brief* 3, no. 26 (September 7, 2000): 2.
46. Assistant Secretary of State Karl Inderfurth cited in "India, Pak Urged to Exercise Restraint," the *Hindu* (India) (November 4, 2000).
47. with the transformation of Pakistan from a failing into a frontline state after the September 11 tragedy, the United States has waived all nonproliferation-related sanctions, as well as the sanctions applied against Pakistan when it came under military rule. Indeed, the Bush Administration seems to have undertaken the challenging task of stabilizing the Pakistani state by making available economic aid.
48. Text of Indian Prime Minister's Address to the Asia Society, New York (October 2000), Internet: http://www.ipcs.org/documents/2000/05-sep-oct.html. These positions have continued unchanged since they were enunciated some two years ago.
49. The word "facilitate" is advisedly used here, as any form of third-party "mediation" is anathema to India; however, New Delhi's resistance to outside intervention has considerably eroded following the India–Pakistan border confrontation in 2001–2002. Apropos, India's constant appeals to the international community to restrain Pakistan's cross-border terrorism into Kashmir has, unintendedly perhaps, succeeded in internationalizing the Kashmir dispute, and weakening its earlier position to shun third party involvement in this matter.
50. Text of the Lahore Declaration (February 21, 1999), Internet: http://www.ipcs.org/documents/1999/1-jan-mar.htm.
51. Nitin A. Gokhale and Murali Krishnan, "Small is Scary," *Outlook* (India) (June 10, 2002), 42–46.
52. P.R. Chari, "Nuclear Restraint and Risk Reduction," the *Hindu* (India) (January 19, 2000).
53. Agha Shahi, Zulfikar Ali Khan, and Abdul Sattar, "Securing Nuclear Peace," 3.
54. Presented in an unpublished paper at the India and Pakistan Nuclear Next Steps Conference held by the Asia-Pacific Center for Security Studies, Honolulu, Hawaii (September 2000), 6–8.
55. General Pervez Musharraf, "Foreign Policy of Pakistan," *Pakistan Horizon* (April–July 2000). See also Musharraf's address to the Pakistan Institute of International Affairs on June 23, 2000 reproduced in *Strategic Digest* (January 2001), 5.

This page intentionally left blank

3

Nuclear Risk Reduction in South Asia: Building on Common Ground

Chris Gagné

After 25 years of speculation about nuclear weapons programs in South Asia and the effect of proliferation on the region's stability, nuclear and ballistic missile tests have proven that India and Pakistan are *de facto* nuclear weapons states.[1] Policy makers in both India and Pakistan have decided that nuclear weapons are desirable and that nuclear deterrence is necessary. But does the mere possession of nuclear weapons fulfill the requirements of stable nuclear deterrence? If India and Pakistan have to work at nuclear risk reduction—if stability is not automatic—how should they go about doing so? What bilateral or unilateral measures might these countries realistically take to reduce the risk of nuclear war resulting from an accident or miscalculation?

Applying Deterrence Theory to South Asia

Scholars disagree about whether nuclear weapons promote stability or instability. "Nuclear optimists" such as Kenneth Waltz argue that offsetting nuclear weapon capabilities is stabilizing because they make war too costly. According to this line of thinking, the destructive power of even a few nuclear weapons is so immense that no rational leader would risk waging war if nuclear retaliation by the enemy were even remotely possible.[2] Waltz claims that when faced with almost certain destruction, military miscalculation becomes unlikely among nuclear powers.[3] Devin Hagerty argued in 1998 that the absence of war in South Asia since the beginning of India's nuclear weapon program is evidence that "evolving nuclear weapon capabilities can have soothing or neutral effects, even during this allegedly destabilizing phase of the proliferation process."[4] "Nuclear pessimists" such as Scott Sagan claim that the potential dangers of nuclear weapons outweigh any stabilizing effect they might have. Sagan argues that serious accidents involving nuclear weapons are bound to occur. He cites numerous examples from the United States where those charged with manning nuclear forces

made grievous errors that were quickly and quietly covered up. In Sagan's view, preventing a catastrophic accident in an increasingly nuclearized world would be extremely difficult, especially in regions of tension with relatively new programs.[5]

The debate is by no means simple. Even if offsetting nuclear arsenals is sufficient to prevent full-scale wars among nuclear powers, nuclear weapons might not deter lower levels of violence. In 1961 Glenn Snyder wrote, "the Soviets probably feel, considering the massive retaliation threat alone, that there is a range of minor ventures which they can undertake with impunity, despite the objective existence of *some* probability of retaliation."[6] Subsequent proxy wars in Vietnam and Afghanistan proved that the United States and the Soviet Union were willing to engage in violence below a certain undefined threshold. Such conflicts illustrate what deterrence theorists have dubbed "the stability–instability paradox," which states that, "to the extent that the military balance is stable at the level of all-out nuclear war, it will become less stable at lower levels of violence."[7] Today, the same rules seem to apply to South Asia where India and Pakistan fought a border war in 1999, one year after both tested nuclear weapons. In this instance, offsetting nuclear capabilities seems to have encouraged military adventurism on the part of Pakistan by creating pressure to keep conflicts localized and deterring a punitive Indian attack across the international border that might have escalated uncontrollably. In December 2001, India responded to a terrorist attack on its parliament building by initiating a massive buildup of conventional forces along the India–Pakistan border—a move that was quickly reciprocated by Pakistan.

Waltz and Hagerty argue that nuclear weapons will serve to keep conflicts limited, even if they do not prevent them, because no rational actor would risk crossing the nuclear threshold. However, Robert Jervis suggests that escalation could conceivably be a rational choice in some instances, motivated by "national honor, the desire to harm and weaken those who represent abhorred values, and the belief that the other will retreat rather than pay the price which can be exacted for victory."[8] Furthermore, Jervis points out that conflicts can take on a dynamic of their own which makes escalation difficult to predict or control:

> Although undesired escalation obviously does not occur all the time, the danger is always present. The room for misunderstanding, the pressure to act before the other side has seized the initiative, the role of unexpected defeats or unanticipated opportunities, all are sufficiently great—and interacting—so that it is rare that decision makers can confidently predict the end-point of the trajectory which an initial resort to violence starts.[9]

In the *Illogic of American Nuclear Strategy*, Jervis acknowledges that nuclear deterrence may prevent wars, but he asserts that conflicts between nuclear powers will resemble the game of "chicken" where each side will be tempted to test the other's resolve. Should this game lead to military activities, there is a danger that the situation will get out of control because "the workings of machines and the reaction of humans in times of stress cannot be

predicted with high confidence."[10] Sagan uses organizational theory to reinforce this position by demonstrating the failures of both man and machine in Cold War crises that could have inadvertently caused a nuclear war.[11]

In making his case for nuclear optimism, Waltz comes close to dismissing the dangers of uncontrolled escalation and unpredictable accidents. However, even his confident view of stable deterrence is predicated on three major requirements: (1) there must be no preventative war while a state is developing its nuclear capability; (2) both states must develop a sufficient second-strike force to retaliate if attacked first; and (3) the nuclear arsenals must not be prone to accidental or unauthorized use.[12] Once the first requirement has been met, Waltz assumes that the second and third conditions are easy to achieve. Because the destructive force of a nuclear weapon is so great, he argues that no rational actor would be willing risk a first strike if even a few of the enemy's missiles or bombers might survive. Furthermore, Waltz claims that even with small arsenals, at least a few weapons are likely to survive a first strike due to dispersal, mobility, and imperfect intelligence. And while Sagan warns that organizations handling nuclear weapons are likely to be accident prone, Waltz argues that smaller arsenals will invite fewer accidents than the large Cold War arsenals did.[13]

None of Waltz's requirements for stable nuclear deterrence have been met in South Asia. Although India and Pakistan have openly tested nuclear devices, the first requirement has not been fully met since both countries remain ambiguous about weaponization. The simplicity of meeting the second condition cannot be taken for granted either. India might still assume that Pakistan's nuclear facilities are vulnerable to a preventative strike. Pakistan is significantly smaller than India geographically, and enjoys less "strategic depth" in which to hide its small arsenal of nuclear weapons and delivery vehicles. The locations of Pakistan's airfields are known to India and are well within reach of its air force and ballistic missiles. In light of this, Pakistan might feel uncomfortable about the survivability of its nuclear deterrent during a crisis. Pakistan might seek to protect its force during a crisis by moving it—an action that could be perceived in Delhi as a prelude to attack. A smaller, conventionally weaker Pakistan might also feel pressured to institute a launch-on-warning policy to defeat a surprise attack. Sagan warns that such policies dramatically increase the risk of accidents. Furthermore, the risk of an accident leading to nuclear war would be particularly great in South Asia where there would be almost no time to distinguish between a deliberate launch, an accident, or a false alarm. Even Waltz argues against a policy of launch-on-warning, emphasizing that it is a mistake not likely to be repeated by new nuclear powers because it "makes no sense." However, when faced with the prospect of being defeated a fourth time by its larger neighbor, a launch-on-warning policy might make sense to Pakistan, which has repeatedly rejected India's no-first-use proposals.

Waltz would argue that a first-strike scenario in South Asia is highly improbable. Sagan would assert that it is nevertheless possible. Both might be right. And while both scholars might disagree about the dangers or

advantages of proliferation, neither would suggest that India and Pakistan should merely bide their time and wait to see whether nuclear optimism or pessimism prevails when put to the ultimate test. In the closing arguments of his debate with Sagan about the consequences of the proliferation of nuclear weapons, Waltz quotes a *New York Times* editorial, which argued that rolling back the nuclear arms race on the subcontinent "will require India and Pakistan to address their insecurity by building mutual confidence and reducing the risk of war." Waltz follows the statement by asserting, "[building mutual confidence and reducing the risk of war] are exactly the effects that the mutual possession of nuclear weapons produce, as some Indians and Pakistanis have come to realize."[14] Robert Jervis also claims that with the spread of nuclear weapons, "the impulses toward cooperation and toward conflict have both been strengthened." But Jervis warns that the interdependence created by the prospect of mutual destruction "does not reliably lead to cooperation." Rather, the impulses of conflict and cooperation create "especially great, and especially contradictory, pressures" for nuclear states.[15]

In the South Asian case, India and Pakistan have not yet adopted nuclear risk-reduction measures (NRRMs). Instead, the contradictory pressures that Jervis warns of have pushed the countries further apart. Since India and Pakistan tested in 1998 and declared themselves nuclear weapons states, they have remained ambiguous about their level of deployment. One year after the tests, they fought a small, but bloody border war, which prompted President Bill Clinton to declare South Asia as "the most dangerous place in the world."[16] Since the Kargil conflict and the subsequent military takeover in Pakistan, neither side has engaged in dialogue about their most pressing bilateral issues, including nuclear risk reduction. The longer India and Pakistan are estranged, the more distrust builds and the more both sides are prone to suspect the worst from each other. In such an atmosphere, the conditions for stable deterrence as described by Waltz, Hagerty, and other nuclear optimists are absent, while the fears raised by Jervis and Sagan about uncontrolled escalation, accidents, and miscalculation become increasingly plausible.

Three years after the tests, deterrence in South Asia is tenuous at best. None of Waltz's conditions for stable nuclear deterrence have been met. Nuclear facilities in Pakistan may still be vulnerable to a first strike. The safety of nuclear facilities and the reliability of command and control systems in India and Pakistan are also in doubt due to the technical and organizational problems inherent in all such systems, particularly in times of crisis. Although it is not likely that either country would rationally contemplate a sudden first strike, the possibility of conflict escalation cannot be denied. Furthermore, Jervis notes, "in nuclear peace-making, the ability to make credible promises is as important as the ability to make credible threats."[17] In the current climate of silence, opacity, and mistrust, promises lack credibility and could encourage military brinksmanship and unwise nuclear policies. As evidenced by Kargil, Pakistan's Kashmir policy is prone to brinksmanship that has the potential to spin out of control, and further undermines Pakistan's credibility as a responsible and rational nuclear state. India's buildup along the

border in 2001–2002 and official statements about the possibility of limited war bilateralized brinksmanship on the Subcontinent, although the euphemism of "coercive diplomacy" was preferred in India. India and Pakistan might not be any more prone to war now than they were prior to the start of their nuclear programs; they might actually be less prone to a deliberate, large-scale conflict. However, the 2002 crisis, the limited war above Kargil, and earlier incidents in the 1980s and 1990s suggest that small, yet dangerous, military crises have become more common in South Asia in the shadow of Indian and Pakistani nuclear deterrents.

During the Cold War, deterrence had to be constantly reinforced by NRRMs on both sides of the Iron Curtain. Some of these measures were unilateral, others bilateral or multilateral, but all of them had the goal of reducing the very real danger of nuclear war, accidental or otherwise.[18] Some of these NRRMs might be adapted to South Asia, others might not, but the implementation of such measures in one form or another is essential for the stability that India and Pakistan seek. Although perfect stability is practically impossible, NRRMs could help India and Pakistan come closer to meeting some of the minimal conditions for stable deterrence proposed by Waltz. Appropriate measures could help safeguard nuclear capabilities in their most vulnerable stage. Actions might also be taken to more confidently alleviate concerns over preemption. Unilateral and bilateral steps could be implemented to improve safety measures for nuclear facilities, weapons, and delivery vehicles. At the very least, clear and reliable lines of communication between political and military officials in both countries could help to limit the chances of escalation from miscalculation and make promises of cooperation more credible. India and Pakistan have already identified areas of common ground where some simple and unintrusive NRRMs could be quickly and easily implemented, leading to more substantive measures in the future. Without secure second-strike capabilities, dialogue, and the necessary political will to sincerely implement even the most basic risk-reduction measures, the risks of a nuclear crisis in South Asia will grow.

Nuclear Threats, Misperceptions, and Security Concerns

The fear of a nuclear exchange is not unwarranted in the region, particularly in light of the stability–instability paradox and the potential for uncontrollable escalation in times of crisis. India and Pakistan have fought four wars in the past 50 years. The scars from the 1971 war, which resulted in the loss of East Pakistan, are still painfully visible on the Pakistani military establishment. Though the first three wars did not appear to have a nuclear dimension, subsequent crises have highlighted growing nuclear dangers in the region.

When details about the Pakistani nuclear weapons program began to emerge in 1983–1984, India reportedly considered an air strike on the enrichment facility at Kahuta. Pakistan had plans for a retaliatory strike and its fears were bolstered by a foreign source that warned of the possibility of

an Indian air strike in September–October 1984. A Central Intelligence Agency briefing to a U.S. Senate intelligence subcommittee stated that U.S. satellites had been unable to locate two of India's Jaguar squadrons and assumed that they were about to launch an attack. A major U.S. television network reported the story shortly thereafter. If India had entertained the option of going to war with Pakistan and attacking Kahuta, the ensuing clamor might have prompted New Delhi to reconsider.[19] It would not be the last close call that the two countries would face.

The Brasstacks crisis soon followed in 1986–1987. As part of a massive peacetime military exercise, India began amassing troops near its western borders in November 1986. In response, Pakistan moved its strike corps to offensive positions on the border. Once again, suspicions arose and tension mounted. For two months, India and Pakistan moved their forces in ways that were mutually provocative with no communication of intent. Then, in late January, India agreed to open talks with Pakistan and assured Pakistan that it did not intend to launch an invasion. After five days of foreign secretary–level talks, both countries promised not to attack each other, to avoid provocative actions along the border, and to pull out their units within fifteen days.[20] While India and Pakistan withdrew their troops from forward positions, the promises they made to avoid provocative actions in the future proved to be empty.

One study asserts that there was an Indian plan to use Exercise Brasstacks and a parallel Operation Trident to provoke a war with Pakistan in order to destroy its nuclear capability before it matured.[21] According to this account, Prime Minister Rajiv Gandhi reportedly was unaware of the intent behind the exercise, even though he was briefed on particulars; Defence Minister Arun Singh and Chief of Army Staff General K. Sundarji planned the operation on their own.[22] Others claim that Brasstacks was converted into Operation Trident in preparation for an offensive response from Pakistan. They dismiss the account of a hidden agenda as speculative and claim that the nuclear question was not a significant issue during Brasstacks, although the crisis might have influenced future nuclear decisions in the region.[23] In either case, during the Brasstacks crisis, there was a near total lack of communication between India and Pakistan and possibly even miscommunication of the highest order within the Indian government. Under these circumstances, the potential for a large-scale conflict in the region was obvious and called for serious measures to reduce the risk of war.[24]

Provocative statements by Dr. A.Q. Khan, then head of Pakistan's uranium-enrichment program, suggested that the urgency of risk reduction might have been even greater than India had understood at the time. In a controversial interview with Indian journalist Kuldip Nayar during the height of the crisis, Khan reportedly claimed that Pakistan had achieved the capability to build nuclear weapons and was prepared to use them if its existence was threatened. However, the interview was not published until several weeks after the crisis had abated, and most of the statements have since been contested or denied by Dr. Khan.[25]

Yet another crisis occurred in 1990 when an indigenous insurrection in the Kashmir valley, quickly backed by Pakistan, threatened to provoke a war between India and Pakistan. As the conflict escalated, Pakistani prime minister, Benazir Bhutto, proclaimed the Kashmiris' right to self-determination while some influential politicians threatened jihad and suggested using nuclear bombs if India waged war against Pakistan.[26] Some reports state that Pakistan actually moved to assemble a nuclear weapon as the crisis heated up.[27] India took the threat of escalation seriously. Officials in the Indian government and military were reportedly uncertain of the capabilities of the Pakistani nuclear program and of India's ability to respond to a nuclear attack.[28] One account of India's nuclear program cites a report that between 1988 and 1990, India readied at least 24 nuclear weapons for quick assembly and potential dispersal to airbases.[29] Another report, however, claims that India did not possess a fail-safe delivery system at the time.[30]

Hoping to reduce tensions in the region, U.S. president, George H.W. Bush, sent Robert Gates, a senior administration official, to South Asia. The Gates delegation worried that a conflict over Kashmir might erupt into a full-scale war. Some analysts in Washington feared that India might provoke Pakistan to resort to nuclear weapons.[31] Others involved in the decision-making process claim that the nuclear dimension was a peripheral concern at most.[32] Many argue that the United States believed that Pakistan's nuclear program might be in possession of a nuclear device and the United States was unsure about who might have the authority, or opportunity, to use such a weapon in an extreme situation.[33] During this crisis, India and Pakistan were content to exchange threats rather than bombs. Soon afterward, both countries took steps to de-escalate tension and resume bilateral talks. But in the wake of this crisis, India and Pakistan intensified their nuclear weapons programs.[34]

After the nuclear tests by India and Pakistan in 1998, some analysts and policy makers in both countries believed that the days of uncertainty and strategic miscalculation were over.[35] Proponents of the Bomb asserted that nuclear deterrence had been achieved and neither side would dare use a nuclear weapon against the other.[36] Others in South Asia and abroad warned that the possession of nuclear weapons would encourage limited or low-level conflicts.[37] This view was proved right in May 1999 when Pakistan surreptitiously deployed troops on the Indian side of the LoC above Kargil. Though the intent of the Kargil plan is still not entirely clear, the damage that the ensuing war dealt to India–Pakistan relations is all too apparent.

The casualties of the Kargil war were high given the relatively localized nature of the conflict. The Indian Army and Air Force suffered 474 killed and 1,109 wounded.[38] Pakistani casualties are difficult to determine since the army has officially denied any involvement. India took great pains to stay on its own side of the LoC, despite the fact that it would mean higher casualties and an uninterrupted supply line for Pakistani troops on the heights. This limited war had an ominous nuclear dimension. Many in Washington worried that the fighting around Kargil might lead to a much larger

conventional conflict. As with the 1990 crisis, they feared that India might be provoked into striking Pakistan across the LoC or even the international border. If such a scenario escalated, Pakistan might at some point feel threatened enough by India's conventional superiority to brandish the nuclear option. Army Chief of Staff General Sundarajan Padmanabhan claims that Pakistan had "activated" one of its nuclear missile bases. While General Padmanabhan is not certain as to whether the Pakistani activity at this site was done in preparation for war or was "a routine activation of the range,"[39] Pakistani officials again resorted to nuclear threats in a crisis.[40] At least one report asserts that India was prepared for a nuclear retaliation and "secretly kept its weapons in an advanced state of readiness."[41]

Once again, in December 2001, the fear of nuclear escalation in the Subcontinent resurfaced when a thwarted terrorist attack on the Indian Parliament in New Delhi quickly escalated to a massive deployment of troops along the India–Pakistan border. In late December 2001, there were reports that India and Pakistan were repositioning missiles.[42] While nuclear concerns were downplayed in both capitals, a major Indian conventional attack, either across the LoC or the international border, appeared imminent for months afterward as shelling intensified and terrorist attacks continued in Kashmir. International fears of uncontrolled escalation were stoked by statements from Pakistani officials. Permanent Representative to the United Nations, Munir Akram, warned that Pakistan would retaliate against Indian aggressions "with its full might" and made it clear that "Pakistan had never subscribed to a 'no-first-use' policy."[43] In early June 2002, several countries issued travel advisories encouraging their citizens to leave India and Pakistan due to rising tensions, prompting[44] one Indian columnist to chide the international community for succumbing to Pakistan's "nuclear blackmail."[45] By late May and early June 2002, the threat of war had become serious enough to warrant visits to the region by British Foreign Secretary Jack Straw, U.S. Deputy Secretary of State Richard Armitage, and U.S. Secretary of Defense Donald Rumsfeld.

Some argue that the 1983–1984 crisis was overblown and even "made in Washington" because it was exacerbated by an intelligence leak and a subsequent media report.[46] Nevertheless, the crisis took on a dynamic that generated security concerns. According to one report, India was not worried about a nuclear threat from Pakistan during the 1990 crisis. In this instance, American intelligence did not divulge information regarding Pakistan's nuclear-related activity and Dr. A.Q. Khan's provocative interview did not see print until the crisis was over.[47] Though the likelihood of a nuclear war in 1990 might not have been great, the possibility was real and the damage would have been horrific. As George Perkovich states, "the combination of Indian and Pakistani willingness to talk to each other even in a crisis atmosphere, and the diplomatic intervention of Moscow, Beijing, and the Gates mission, enabled the crisis to be dissipated."[48] Likewise, India's willingness to restrict its military action to Kargil in 1999 and Nawaz Sharif's willingness to call on Washington for help prevented the conflict from spilling over

the LoC and possibly provoking a nuclear response from Pakistan. External pressures again played an essential role in 2002, eliciting from President Musharraf a pledge to end permanently infilitration across the LoC—a pledge he subsequently qualified.

Opposing nuclear programs in South Asia seem to have reduced the chance of full-scale war while making small, but provocative, crises more common. The fact that none of these crises have led to a deliberate or accidental nuclear exchange does not mean that the potential for escalation or accidents should be dismissed. Indian and Pakistani complacency regarding nuclear risk reduction in spite of their many crises is cause for concern. Kargil might have been the most recent and most intense of these crises, but it will not be the last. Though Kargil ended in a tactical defeat for the Pakistani Army, there are influential voices in Pakistan who argue that Nawaz Sharif should have resisted international pressure and allowed the offensive to continue. As long as Pakistani decision makers believe that military pressure can force a solution on Kashmir, more crises will occur. The 2002 crisis, the limited war above Kargil, and earlier incidents have proven that the stability–instability paradox is applicable to South Asia. Each country will continue to test the other's resolve and crises will result. How frequent these crises are and how much they will be allowed to escalate will depend on how serious India and Pakistan are about taking steps to reduce nuclear dangers and the role played by the international community.

Rhetorical Risk Reduction

India and Pakistan have poor records on confidence building and no current dialogue on nuclear risk reduction. While India overtly demonstrated its nuclear technology in 1974, both the Indian and Pakistani nuclear programs evolved quietly to avoid outside pressures. In tandem with its own nuclear program, and perhaps as a cover for it, Pakistan began promoting bilateral and multilateral initiatives purportedly to slow down or reverse the nuclearization of the region. In 1991, India began to show at least some interest in allaying the fears of Pakistan and the international community when it formally agreed to three bilateral confidence-building measures, including an agreement not to attack nuclear facilities.[49] However, implementation of these measures was circumspect and the issue of reducing nuclear dangers did not resurface until the nuclear tests in 1998.

Pakistan, understandably concerned by India's first nuclear test in 1974, submitted its original proposal for a South Asian Nuclear Weapons-Free Zone to the UN General Assembly in November 1974. In July 1981, Pakistan's foreign minister, Agha Shahi, met with Indian foreign minister, Narasimha Rao, in New Delhi. Shahi formally proposed that the two countries engage in bilateral talks to reach agreement on a mutually acceptable ratio of conventional armed forces and armaments, a condition that Pakistan has consistently linked with both conventional and nuclear stability. His proposal marked the beginning of what Shahi has called Pakistan's "peace

offensive," a lengthy string of proposals made to India over the next several years for agreement on bilateral and multilateral arms-control measures regarding both conventional and nuclear weapons. By the end of the Zia era, these proposals included the following: renunciation of the acquisition or manufacture of nuclear weapons by both India and Pakistan (1978); comprehensive mutual inspection of each other's nuclear facilities (1979); simultaneous mutual acceptance of International Atomic Energy Agency "full-scope safeguards" (1979); simultaneous accession to the Non Proliferation Treaty (1979); a bilateral South Asian Comprehensive Test-Ban Treaty (1987); and a mutual conference under UN auspices on nuclear nonproliferation in South Asia (1987). None of these measures were accepted by India. If they had been, Pakistan, as the weaker power, might have found them difficult to adhere to.

For over 15 years, Indian and Pakistani nuclear programs were pursued without any agreements to reduce the risk of accidents, primarily because their programs were secret. Finally, in 1991, a series of agreements prompted by the 1990 crisis attempted to rectify the situation in very limited, yet significant, ways. An Agreement on the Prior Notification of Military Exercises and another on the Prevention of Airspace Violations attempted to prevent miscalculation that might lead to an unintended conflict—conventional or otherwise. The 1991 Agreement on the Non-Attack of Nuclear Facilities was aimed at reducing nuclear risks between India and Pakistan through preventing dangerous conventional attacks on nuclear installations. Under this agreement, both sides are obliged to voluntarily provide a list of coordinates of their various nuclear facilities each year. Though the impetus for the agreement was media coverage surrounding India's plan to launch an air strike on the Pakistani enrichment facility in Kahuta in 1984, the agreement was not signed until four years later and laid dormant for another three years before ratification.

The nuclear tests by India and Pakistan in May 1998 dramatically changed the nuclear landscape of South Asia. Although both countries possessed clandestine nuclear capabilities for nearly a decade, the difficult task of reducing nuclear dangers had been episodic and poorly implemented. With the Bomb clearly out of the basement, domestic constituencies and the glare of the international community generated pressure on both sides of the LoC to demonstrate responsibility. Subsequently, India and Pakistan have both proposed several nuclear risk-reduction measures, however, no formal agreements have been reached. Progress has not yet moved beyond the realm of statements and memoranda. As long as there are no talks about NRRMs, it will be difficult for Indian and Pakistani leaders to demonstrate responsible stewardship of nuclear weapons.

Seeking Common Ground

Nuclear risk reduction received a hopeful push a year prior to the 1998 tests. Prime ministers I.K. Gujral and Nawaz Sharif authorized their foreign secretaries to agree on an eight-point agenda for talks in June 1997. The foreign

secretaries enumerated a comprehensive list of issues to be addressed by official teams from each country. The categories included: peace and security; Jammu and Kashmir; Siachen; Wullar Barrage/Tulbul Navigation Project; Sir Creek; terrorism and drug trafficking; economic and commercial cooperation; and the promotion of friendly exchanges in various fields.[50] The agenda for a comprehensive dialogue, including discussions on how to reduce the risk of nuclear conflict, followed pledges from both prime ministers to reinstate the oft-ignored prime ministerial hotline that had originally been established by Benazir Bhutto and Rajiv Gandhi in 1989. Gujral and Sharif made use of this hotline in October of 1997 when tensions on the LoC were particularly high.

In spite of, or perhaps because of the nuclear tests, prime ministers A.B. Vajpayee and Nawaz Sharif agreed to follow through with the 1997 agenda for talks in September 1998. Foreign secretaries Shamshad Ahmed and K. Raghunath met in October to discuss formally the first two outstanding issues: peace, security, and CBMs and Jammu and Kashmir. Despite the continued impasse over Kashmir, each side came to the table with a list of proposals for avoiding dangerous conflicts.

The Indian proposals included:[51]

- Agree to a No-First-Use pact. India had made this offer repeatedly since July 1998. New Delhi reiterated its unilateral commitment to no-first-use in a proposal entitled "Preventing Use of Nuclear Weapons," which asserted that nuclear weapons should never be used. It proposed that both India and Pakistan develop an agreement on preventing nuclear war due to the accidental or unauthorized use of nuclear weapons.
- Formalize an agreement on advanced notification of ballistic missile flight tests. India also suggested that any such tests should not be conducted in the direction of the other party. The proposal suggested that notification of ballistic missile tests above a certain threshold would lead to greater transparency and predictability.
- Extend Agreement on Prohibition of Attack against Nuclear Installations and Facilities to include a promise not to target population and economic centers with nuclear weapons.
- Verify and exchange seismic data. Such an exchange would assuage fears that either country was secretly conducting further tests. The exchange of information would be conducted with a view to enhancing cooperation and transparency and would also help scientists develop a better understanding of regional seismic characteristics.
- Cooperate in multilateral forums toward complete nuclear disarmament.
- Improve confidence-building measures that have been agreed to but not satisfactorily implemented. Specifically, India asserted that improved communications between India and Pakistan are an important component of confidence building. In light of this, India proposed that the hotline between directors general of military operations (DGMOs) be made fail-safe and secure with voice, fax, and computer communication. India

proposed similar communication links for the foreign secretaries, Chiefs of Naval Staff (Operations), Chiefs of Air Staff (Operations), and division commanders.
- Enhance the Agreement on Advance Notice on Military Exercises, Manouvres and Troop Movements and the Agreement on Prevention of Air Space Violations and for Permitting Over Flights and Landings by Military Aircraft. India acknowledged that both agreements provide for information exchange and lead to greater transparency and predictability. Arguing that the effectiveness of the agreements needs to be enhanced, India suggested that the two countries establish a consultative working mechanism to periodically review the implementation of the agreements and explore refinements, particularly along the LoC.
- Participate in high-level defense officer exchanges.
- Implement a ceasefire along the LoC.
- Cease hostile propaganda.

At the October 1998 meeting, Pakistan presented a broad outline of proposals under the heading of Peace and Security, on which they elaborated:[52]

- Abide by the nonuse of force and the peaceful settlement of disputes. This proposal included the identification of issues of peace and security between India and Pakistan, mechanisms for the peaceful settlement of disputes, and a nonaggression pact.
- Implement a strategic restraint regime in South Asia including both nuclear and conventional measures. Proposals for nuclear restraint and stabilization included the prevention of a nuclear and ballistic missile race, risk reduction mechanisms, the avoidance of nuclear conflict, a formalized moratorium on nuclear testing, the noninduction of anti-ballistic missile and submarine-launched ballistic missile systems, and a nuclear doctrine of minimum deterrence. As a measure for conventional restraint and stabilization, Pakistan proposed a mutual and balanced reduction of forces and armament.
- Implement confidence-building measures. Among these measures was a proposal to review existing CBMs including measures to prevent the violation of airspace and territorial waters, and the prior notification of military exercises. Pakistan also proposed to enhance and upgrade existing hotlines between DGMOs and sector commanders as well as the hotline between the prime ministers. Other measures included a revival of pre-Simla ground border rules and restraint on hostile propaganda.

After talks had concluded in November, Pakistan proposed a non-deployment agreement, though details were not provided.

In October 1998, the differences between India and Pakistan in the area of CBMs and NRRMs were clear on a few key points. Pakistan's call for a mutual and balanced reduction of forces and armament was not new and was clearly aimed at limiting India's growing conventional advantage. Similarly, Pakistan's proposal for an agreement on the nonuse of force was also aimed

at neutralizing India's conventional superiority while not expressly forbidding Pakistan's assistance to militancy in Kashmir.

India's proposal to extend the Agreement on Prohibition of Attack against Nuclear Installations and Facilities was not on Pakistan's agenda—perhaps because Pakistan, as the weaker power, views a counter-value strategy as the most feasible mode of deterrence. India has never been clear about what would constitute a minimum credible deterrent, and its proposal to spare counter-value targets seems to suggest a more ambitious counterforce strategy that would put Pakistan at a disadvantage. India's proposal for a ceasefire on the LoC was also unacceptable to Pakistan at the time. Keeping the LoC "hot" is a strategy that both helps the infiltration into Indian Kashmir and draws international attention to the Kashmir dispute.

While India and Pakistan had expressed differences on how to reduce the risk of conflict, they also found significant common ground. Obviously, both sides expressed an interest in avoiding a nuclear conflict. Both countries clearly agreed on the basic need to improve the lines of communication between high-level political and military officials, though neither stated openly the reasons for the failure of these measures in the past. India and Pakistan also acknowledged a need to revisit some of their earlier agreements, specifically the Agreement on Advance Notice on Military Exercises, Manouvres and Troop Movements. Again, both sides recognized poor implementation, but neither presented a list of reasons for the problem. Restraint on hostile propaganda was another area of broad agreement, though details as to how this vague proposal would be implemented were not discussed.

On February 21, 1999, the comprehensive dialogue was followed by the Lahore summit. Lahore had three products, a Joint Statement by the prime ministers, a Memorandum of Understanding (MoU) by the foreign secretaries, and the Lahore Declaration itself, again made by the prime ministers.

The Lahore Declaration made several references to the nuclear issue. The prime ministers recognized that "the nuclear dimension of the security environment of the two countries adds to their responsibility for avoidance of conflict between the two countries," and asserted that they were "committed to the objective of universal nuclear disarmament and non-proliferation." They also noted that they were "convinced of the importance of mutually agreed confidence-building measures for improving the security environment." Nawaz Sharif and A.B. Vajpayee agreed to seven points in the declaration. Among these was an agreement to "take immediate steps for reducing the risk of accidental or unauthorized use of nuclear weapons and discuss concepts and doctrines with a view to elaborating measures for confidence-building in the nuclear and conventional fields, aimed at prevention of conflict."[53]

The MoU was signed by Indian foreign secretary, K. Raghunath, and Pakistani foreign secretary, Shamshad Ahmad. It acknowledged "the directive given by their respective Prime Ministers in Lahore, to adopt measures for promoting a stable environment of peace and security between the two countries." Seven of the eight points the foreign secretaries listed in the MoU directly addressed nuclear risk reduction for the first time. An item

referring to the prevention of incidents at sea has at least some significance to the nuclear issue given that India has announced its intention to nuclearize its navy in the future and Pakistan has suggested that it might follow suit:[54]

1. The two sides shall engage in bilateral consultations on security concepts, and nuclear doctrines, with a view to developing measures for confidence-building in the nuclear and conventional fields aimed at avoidance of conflict.
2. The two sides undertake to provide each other with advance notification in respect of ballistic missile flight tests, and shall conclude a bilateral agreement in this regard.
3. The two sides are fully committed to undertaking national measures to reducing the risks of accidental or unauthorized use of nuclear weapons under their respective control. The two sides further undertake to notify each other immediately in the event of any accidental, unauthorized or unexplained incident that could create the risk of a fallout with adverse consequences for both sides, or an outbreak of a nuclear war between the two countries, as well as to adopt measures aimed at diminishing the possibility of such actions, or such incidents being misinterpreted by the other. The two sides shall identify/establish the appropriate communication mechanism for this purpose.
4. The two sides shall continue to abide by their respective unilateral moratorium on conducting further nuclear test explosions unless either side, in exercise of its national sovereignty, decides that extraordinary events have jeopardized its supreme interests.
5. The two sides shall conclude an agreement on prevention of incidents at sea in order to ensure safety of navigation by naval vessels, and aircraft belonging to the two sides.
6. The two sides shall periodically review the implementation of existing CBMs and where necessary, set up appropriate consultative mechanisms to monitor and ensure effective implementation of these CBMs.
7. The two sides shall undertake a review of the existing communication links (e.g. between the respective [DGMOs] with a view to upgrading and improving these links, and to provide for fail-safe and secure communications).
8. The two sides shall engage in bilateral consultations on security, disarmament and non-proliferation issues within the context of negotiations on these issues in multilateral fora.[55]

The MoU concluded that "where required, the technical details of the above measures will be worked out by experts of the two sides in meetings to be held on mutually agreed dates, before mid 1999, with a view to reaching bilateral agreements."

The Joint Statement by Sharif and Vajpayee was issued at the end of Vajpayee's visit to Lahore. It asserted, among other things, that "the two

foreign ministers will meet periodically to discuss all issues of mutual concern, including nuclear related issues." The Statement also made reference to the MoU "aimed at promoting an environment of peace and security between their countries" and noted that "the two Prime Ministers signed the Lahore Declaration embodying their shared vision of peace and stability between their countries. . . ."[56]

The text of the MoU is clearly the most significant of the three Lahore documents in terms of nuclear risk reduction. Virtually all of the points in the Memorandum were items raised either by India, Pakistan, or both, during the foreign secretaries' meeting in October. The first and third points in the MoU express a commitment to avoid nuclear conflict and reduce the risk of accidental use of nuclear weapons—items that were on the agenda of both countries in October. The sixth and seventh points—pledging to review and implement existing CBMs and hotlines—were also items of mutual concern at the earlier meeting. Two items that India specifically brought to the table in October found their way into the Memorandum as well: the advanced notification of ballistic missile flight tests and cooperation on nuclear issues in multilateral forums were not items that appeared on Pakistan's outline for discussion, but were welcomed nonetheless at Lahore. Finally, Pakistan's proposal to formalize the moratorium on nuclear testing was accommodated in the MoU via a pledge by both sides to continue their unilateral moratorium with a clause permitting them to test in the case of extraordinary events.

While the details of the negotiations in October 1998 and February 1999 regarding nuclear risk reduction and confidence building are not known, the proposals and the MoU that followed suggest that India and Pakistan found at least some common ground on the issue. The combination of items in the MoU indicates that in some areas where their priorities might have differed, both sides were willing to compromise.

India and Pakistan have yet to agree on the technical details of any of the measures listed in the MoU. Technical level talks were agreed to in principle at Lahore, but they have been held hostage to the political tension left over from Kargil. Until the details are finalized and the pledges made at Lahore are implemented, nuclear risk reduction in South Asia will remain rhetorical, just as proposals for avoiding conflicts have for decades. If the history of India–Pakistan relations is any indication, more crises will follow and the credibility of their rhetoric will continue to suffer.

Sticking Points

Nuclear risk reduction will never be realized if India and Pakistan do not have a sustained, serious, and purposeful dialogue. While Islamabad has repeated its offer to engage in a dialogue "anywhere and anytime," New Delhi continues to dwell on Pakistan's support for the militancy in Kashmir. Even if India were to restart a dialogue, Pakistan might be tempted to hold NRRMs hostage to the Kashmir issue.

Nuclear risk reduction is desirable on its own terms as a means of safeguarding the lives of hundreds of millions of innocent people on the subcontinent, including Kashmiris. An agreement not to change the *status quo* by force in Eastern Europe, where Soviet troops and North Atlantic Treaty Organization troops were eye to eye, contributed to stable nuclear deterrence during the Cold War. Pakistan's Kashmir policy seeks to change the *status quo* in Kashmir by supporting insurgency in the Valley and engaging in skirmishes along the LoC. Unless Pakistan changes its Kashmir policy, stable deterrence might not be possible in South Asia. Opposing nuclear weapons programs in South Asia have made the region crisis prone because it is now harder for India to deter low levels of violence without raising fears of a nuclear conflict. Attempts to change the *status quo* will lead to more crises like Kargil, which could escalate and become difficult to control. Under duress, accidents and miscalculations are likely to occur and could conceivably lead to a nuclear war. Pakistan and India have signed several confidence-building measures but never publicized them because of the Kashmir dispute. Unless both countries are able to soften their positions on Kashmir, new attempts at nuclear risk reduction will be as unsuccessful as previous CBMs have been.

Political one-upsmanship provides another challenge to nuclear risk reduction. There is a tendency on both sides to make "friendly" overtures that are knowingly untenable to the other, in an attempt to look good to the international community and to domestic constituencies. A no-first-use pact will not be acceptable to Pakistan because of India's conventional superiority. Likewise, a no-war pact will not be acceptable to India as long as Pakistan challenges the *status quo* in Kashmir by supporting militancy. Focusing on these proposals is not only unhelpful, it retards progress by making differences in the area of nuclear risk reduction appear greater than they really are.

The prior emphasis by Indian and Pakistani leaders on declaratory measures is not helpful in an atmosphere devoid of trust. A no-first-use policy is low on substance and difficult to verify without intrusive measures to demonstrate a reduced state of readiness, including keeping warheads separate from delivery vehicles and other indications of recessed deterrence. Furthermore, such a policy would undermine Pakistan's option to use nuclear weapons to deter a massive conventional attack. What are needed are nuclear risk-reduction measures that are specific, substantive, and verifiable.

THE WAY AHEAD

When India and Pakistan resume official contact, talks on NRRMs should focus on the common ground that India and Pakistan have established through past proposals and the Lahore MoU. Because there are many obstacles in the way of nuclear risk reduction, both countries might first build momentum with small initiatives that are relatively easy to implement. India and Pakistan have started the process by agreeing to broad concepts of nuclear risk reduction and confidence building in principle. Both countries

could proceed by narrowly focusing on common ground. Subsequent discussions could translate common ground into detailed nuclear risk-reduction and CBMs and strategies for their implementation. If agreed measures have not been properly implemented in the past, the reasons for their failure or neglect must be carefully considered and frankly discussed. New standards of implementation are essential. If India and Pakistan are able to successfully implement a few simple NRRMs, bolder more comprehensive steps could eventually follow.

Both sides agree that improved communications are essential. The form of communication proposed most often has been a hotline between prime ministers and DGMOs. Such measures have been used only sporadically in the past, despite several pledges at the highest level. Communication was infrequent and unreliable even when relations were not as strained as they have been since Kargil and the subsequent military takeover in Pakistan. In recent years, the hotlines have seen some use. Gujral and Sharif used the prime-ministerial hotline in August 1997, and the DGMO hotline was supposedly used in August 1998. Some communication took place during the Kargil war, but the effect was probably limited by the fact that Pakistan officially denied any involvement. It is possible that India and Pakistan may have discussed the movement of Indian missiles during the conflict, but details have not been made public. Indian proposals to maintain hotlines for division commanders in areas along the border and the LoC should be implemented, along with measures to make all hotlines secure and redundant with phone, fax, and electronic links. In a climate of nuclearized animosity, hotlines and other means of official communication must not be held hostage to foolish pride. Both countries could easily make good on this very simple measure, provided India and Pakistan make efforts to convince their constituencies that risk reduction is necessary and not a sign of weakness.

India and Pakistan agreed at Lahore that advanced notification of ballistic missile tests is desirable. But even with no formal agreement, the Government of India reportedly notified Pakistan, China, and others of its test of the Agni II on January 17, 2001. Similarly, Pakistan has also notified India and others about some of its ballistic missile tests since the Lahore Summit, including a series of tests conducted during the 2002 crisis.[57] The fact that both countries have prenotified ballistic missile flight tests after the Kargil war, even in the absence of an agreement, is evidence that India and Pakistan perceive a need for such a measure. A formal agreement in this area would be straightforward and easy to verify because missile test flights are not difficult to detect and many countries outside the region are watching closely for such developments. Such an agreement might not produce any significant change in the policies of India or Pakistan regarding notification, but it would help to demonstrate that both sides recognize the importance of formal cooperation in nuclear risk reduction. An agreement on the notification of ballistic missile flight tests would help to generate goodwill and build momentum toward more difficult measures in the future.

In the MoU, India and Pakistan acknowledged the need to share pertinent information in order to help prevent catastrophic miscalculation. The exchange of nuclear information between the two countries to help prevent miscalculation has at least some precedent in the agreement to annually exchange information on the location of nuclear installations as per the 1991 Agreement on the Non-Attack of Nuclear Facilities. Under this agreement, India and Pakistan are obliged to exchange lists of nuclear facilities on the first business day of each year. Thus far, lists have been exchanged each year, but the completeness of these lists is questionable. It might be beneficial to both sides to expand this established channel so as to include the exchange of other data that would help reduce mutual suspicions. Such data could include the locations and activities of major industrial plants or facilities that produce or store hazardous chemicals or wastes. Official channels for communication at lower bureaucratic levels would subsequently cut down on distracting media attention by making such exchanges routine and less sensational.

Admittedly, it will be difficult for India and Pakistan to reach new agreements for exchanging sensitive information about their nuclear weapons programs. The exchange of some information might actually be destabilizing. Revealing potential targets is feasible, but in this early stage of weaponization, neither country is confident enough to reveal much about their nuclear capabilities. This reluctance is understandable given that Pakistan, in particular, may not feel it has a sufficient second-strike capability to deter a preemptive attack. While India and Pakistan may not be ready to show much transparency in terms of capability, they could still benefit from making their nuclear intentions more transparent. Neither side has been open about its nuclear doctrine. Some clear discussion in this area should be possible without divulging sensitive information about current capabilities. India and Pakistan might also formally agree to notify one another of their respective missile alert status during times of crisis. At the very least, there could be some official discussion about what kinds of nuclear, missile, or military activities would be considered threatening to the other side, along with steps taken to prevent these activities from occurring. Doing so will help to prevent unintentional crises that could lead to nuclear war.

Both sides claim to be committed to unilateral moratoriums on nuclear tests even though neither has signed the CTBT. Signing the CTBT would be a bold indication that India and Pakistan are willing to take steps to avoid a dangerous arms race in the region. Officials in both countries claim to be confident in their deterrent capacity. A bilateral test ban treaty, or a bilateral pledge to refrain from further tests, might be a step in the right direction. Such a treaty or pledge would be reasonably verifiable given the limited test sites in both countries and the international scrutiny on both of their programs.

There are other possible risk-reduction measures, aside from those that India and Pakistan have discussed in principle, that might be useful and acceptable to both countries in the near term. One such measure might be

for India to share some of its high-resolution satellite pictures with Pakistan. India has reconnaissance satellites that are capable of producing detailed images of Indian and Pakistani military movements and missile-related activities. If India were to share images of its own territory with Pakistan, this might help to reduce confusion and the potential for miscalculation in Islamabad. India would have little to lose since such images are available through commercial channels anyway. An agreement to share satellite images would be another gesture that might do little on its own, but would help give thrust to a more substantial process of nuclear risk reduction.

Measures such as non-deployment, or decoupling warheads from delivery systems might be the most effective NRRMs, but they are also the most complicated and the hardest to negotiate, particularly given the present level of mistrust and confusion regarding nuclear doctrines and capabilities. Talking about such long-term strategies is important, but realizing them will be an incremental process built upon more expedient steps.

Conclusion

Even deterrence optimists argue that stability cannot exist in a vacuum devoid of cooperation or communication. Stable nuclear deterrence, though extraordinarily difficult, might be possible in South Asia, but only with luck and great political effort by India and Pakistan. The nuclear deterrent does not discourage all military adventures. In South Asia, offsetting nuclear capabilities have been accompanied by military and nuclear crises, culminating in a limited war in 1999 during which the president of the United States was called upon to prevent further escalation. In the absence of sustained and high-level international involvement, another war is possible. Contrary to what India hoped, bringing the Bomb out of the basement has not encouraged prudent behavior by Pakistan. Islamabad appears confident that its nuclear capabilities will both deter India from invading and keep Kashmir in the news. On January 12, 2002, Musharraf promised to put an end to cross-border terrorism in Kashmir,[58] but it will take courage on the part of Pakistani leaders and continued pressure from the international community to produce a lasting change in Pakistan's Kashmir policy. An unchanged Pakistani Kashmir policy combined with India's refusal to talk to Pakistan about their most pressing bilateral issues, including Kashmir and nuclear risk reduction, will ensure continued nuclear dangers. Even if cool heads prevail in future crises, as they have in the past, the institutions that support Indian and Pakistani nuclear deterrents would be pushed to the limits of safety. Without mechanisms to avoid unintended conflicts and reduce tension in times of crises, deterrence in South Asia is far from guaranteed.

India and Pakistan have already started to clear a path toward nuclear risk reduction. They have identified areas of common interest through proposals in 1998 and at the Lahore summit in 1999. Swift progress on many of these proposals will be possible if India and Pakistan are willing to move forward. By making progress on the simplest and least contentious proposals agreed

to in Lahore, India and Pakistan could reduce some of the risks of nuclear conflict while building confidence that might make more comprehensive nuclear risk-reduction measures possible in the future. The prospects for stable nuclear deterrence in South Asia are not bright. India and Pakistan need a sustained process of nuclear risk reduction.

NOTES

1. An earlier version of this essay was originally published in Michael Krepon and Chris Gagné, eds., *The Stability–Instability Paradox: Nuclear Weapons and Brinksmanship in South Asia* report no. 38 (Washington, DC: The Henry L. Stimson Center, June 2001), 37–58.
2. Scott D. Sagan and Kenneth N. Waltz, *The Spread of Nuclear Weapons: A Debate* (New York: W.W. Norton & Company, 1995), 24–25.
3. Ibid., 8.
4. Devin T. Hagerty, *The Consequences of Nuclear Proliferation: Lessons from South Asia* (Cambridge, MA: The MIT Press, 1998), 6.
5. Scott D. Sagan, *The Limits of Safety* (Princeton, NJ: Princeton University Press, 1993); Sagan and Waltz, *The Spread of Nuclear Weapons.*
6. Glenn Snyder, *Deterrence and Defense* (Princeton, NJ: Princeton University Press, 1961), 226.
7. Robert Jervis, *The Illogic of American Nuclear Strategy* (Ithaca, NY: Cornell University Press, 1984), 31.
8. Ibid., 135.
9. Ibid., 140.
10. Ibid., 138.
11. Sagan, *The Limits of Safety.*
12. Sagan and Waltz, *The Spread of Nuclear Weapons*, 51.
13. Ibid.
14. Sagan and Waltz, *The Spread of Nuclear Weapons*, 112; "Disarming the Subcontinent," *New York Times* (March 29, 1994).
15. Jervis, *The Illogic of American Nuclear Strategy*, 30–31.
16. "India and Pakistan: Preparing for an American Visitor," *Economist* (March 18, 2000).
17. Jervis, *The Illogic of American Nuclear Strategy*, 167.
18. See Agreement on Measures to Reduce the Outbreak of Nuclear War Between the United States of America and the Union of Soviet Socialist Republics ("Accident Measures" Agreement) (September 30, 1971), in *Documents on Disarmament 1971* (Washington, DC: United States Arms Control and Disarmament Agency, 1970), 634–35; Declaration of Basic Principles of Relations Between the United States of America and the Union of Soviet Socialist Republics (May 29, 1972), in *Documents on Disarmament 1972* (Washington, DC: United States Arms Control and Disarmament Agency, 1974), 237–40; Concluding Document of the Conference on Security and Cooperation in Europe (Helsinki Final Act) (August 1, 1975), in *Documents on Disarmament 1975* (Washington, DC: United States Arms Control and Disarmament Agency, 1977), 304–08; Document of the Stockholm Conference on Confidence- and Security-Building Measures and Disarmament in Europe (Stockholm Document) (September 19, 1986), in *Documents on Disarmament*

1986 (Washington, DC: United States Arms Control and Disarmament Agency, 1991), 555–69; and Vienna Document 1990 of the Negotiations on Confidence- and Security-Building Measures Convened in Accordance with the Relevant Provisions of the Concluding Document of the Vienna Meeting of the Conference on Security and Co-operation in Europe (Vienna Document 1990) (November 17, 1990), Internet: http://www.state.gov/www/global/arms/bureau_pm/csbm/vienna_1990.html.

19. W.P.S. Sidhu, "India's Security and Nuclear Risk-Reduction Measures," *Nuclear Risk-Reduction Measures in Southern Asia* report no. 26 (Washington, DC: The Henry L. Stimson Center, 1998), 38–39; George Perkovich, *India's Nuclear Bomb: The Impact on Global Proliferation* (Berkley, CA: University of California Press, 1999), 240; Hagerty, *The Consequences of Nuclear Proliferation*, 86 fn. 96–97.
20. Hagerty, *The Consequences of Nuclear Proliferation*, 102; "Indo-Pak Accord to De-Escalate Border Tension," *The Statesman* (India) (February 5, 1987).
21. Raj Chengappa, *Weapons of Peace: Secret Story of India's Quest to Be a Nuclear Power* (New Delhi: Harper Collins Publishers India, 2000), 322.
22. Chengappa, *Weapons of Peace*, 322–23.
23. Kanti P. Bajpai, P.R. Chari, Pervaiz Iqbal Cheema, Stephen P. Cohen, and Sumit Ganguly, *Brasstacks and Beyond: Perception and Management of Crisis in South Asia* (New Delhi: Manohar, 1995), 40; Hagerty, *The Consequences of Nuclear Proliferation*, 96–116.
24. Chengappa, *Weapons of Peace*, 323; Bajpai et al., *Brasstacks and Beyond*.
25. Hagerty, *The Consequences of Nuclear Proliferation*, 102–05; Bajpai et al., *Brasstacks and Beyond*, 5.
26. Chengappa, *Weapons of Peace*, 356; Hagerty, *The Consequences of Nuclear Weapons*, 140–41.
27. Perkovich, *India's Nuclear Bomb*, 293, 308–09; Hagerty, *The Consequences of Nuclear Weapons*, 154; Seymour Hersh, "On the Nuclear Edge," *New Yorker* (March 1993), 56–57, 61–64, 66–67.
28. Chengappa, *Weapons of Peace*, 357.
29. Perkovich, *India's Nuclear Bomb*, 293.
30. Chengappa, *Weapons of Peace*, 356–58.
31. Hagerty, *The Consequences of Nuclear Proliferation*, 152–56; Chengappa, *Weapons of Peace*, 358–59.
32. Ambassador Robert Oakley and Col. Don Jones cited in Michael Krepon and Mishi Faruqee eds., *Conflict Prevention and Confidence-Building Measures in South Asia: The 1990 Crisis*, occasional paper no. 17 (Washington, DC: The Henry L. Stimson Center, 1994), 2, 4, 8, 39.
33. *Perkovich, India's Nuclear Bomb*, 293; Chengappa, *Weapons of Peace*, 358–59; Hagerty, *The Consequences of Nuclear Proliferation*, 152–56.
34. Chengappa, *Weapons of Peace*, 358–59.
35. Pran Chopra, "A Disappointing Debate (Nuclear Tests)," the *Hindu* (India) (June 24, 1998).
36. Jaswant Singh, "Against Nuclear Apartheid," *Foreign Affairs* 77, no. 5 (September/October 1998): 41–52; K. Subrahmanyam, "Past Imperfect: Time for New Nuclearspeak," *Times of India* (August 3, 1998); "A Call for Joint Nuclear Front of India and Pakistan," *The Daily News* (Sri Lanka) (July 9, 1998).
37. Sumit Ganguly, "Indo–Pakistani Nuclear Issues and the Stability/Instability Paradox," *Studies in Conflict and Terrorism* 18 (1995), 325–34; Jasjit Singh, "Press for Total Disarmament," *Indian Express* (June 4, 1998).

38. *Kargil Review Committee Report* (December 15, 1999), Executive Summary.
39. Raj Chengappa, Interview with General Sundarajan Padmanabhan, *The News Today* (January 12, 2000).
40. "Any Weapon Will Be Used, Threatens Pak.," the *Hindu* (India) (June 1, 1999).
41. Chengappa, *Weapons of Peace*, 9.
42. See Atul Aneja and Sandeep Dikshit, "Pakistan Moves Missiles Closer to Border," the *Hindu* (India) (December 26, 2001), Internet: http://www.hinduonnet.com/thehindu/2001/12/26/stories/2001122606070100.htm; "India's Missile System 'In Position': Fernandes," the *Hindu* (India) (December 27, 2001), Internet: http://www.hinduonnet.com/thehindu/2001/12/27/ stories/2001122703351100.htm; and "Delhi Positions Missiles on Border," *Dawn* (Pakistan) (December 27, 2001), Internet: http://www.dawn.com/ 2001/12/27/top5.htm. See also "Pak. Rules Out Nuclear War," *Dawn* (Pakistan) (December 28, 2001), Internet: http://www.dawn.com/2001/ 12/28/top3.htm.
43. "Press Conference by New Permanent Representative of Pakistan," UN News Briefing (May 29, 2002), Internet: www.un.org/News/briefings/docs/2002/pakistanpc.doc.htm.
44. Sridhar Krishnaswami, "'Avoid Travel to India,'" the *Hindu* (India) (June 1, 2002), Internet: http://www.hinduonnet.com/thehindu/2002/06/01/stories/2002060103570100.htm; "More Foreigners Leaving India," the *Hindu* (India) (June 2, 2002), Internet: http://www.hinduonnet.com/thehindu/2002/06/02/stories/2002060203110100.htm.
45. Sanjaya Baru, "Not an Advisable Advisory," *Indian Express* (June 3, 2002), Internet: www.indian-express.com. See also "Beyond Terrorism," *Indian Express* (June 12, 2002), Internet: http://www.indian-express.com.
46. Sidhu, "India's Security," 39.
47. Perkovich, *India's Nuclear Bomb*, 310.
48. Ibid.
49. Agreement between India and Pakistan on Prohibition to Attack Against Nuclear Installations and Facilities, (December 31, 1988), Internet: http://www.indianembassy.org/South_Asia/Pakistan/Prohibition_Attack_Nuclear_Dec_31_1988.html.
50. Amit Baruah, "India, Pak. Reach Accord on Joint Working Groups," the *Hindu* (June 24, 1997); Raja Asghar, "Pakistan PM calls talks with India breakthrough," *Reuters* (June 23, 1997).
51. The texts of the non-papers exchanged by the foreign secretaries of India and Pakistan in October 1998 have not been made public. Information paraphrased in this section is based on author interviews with anonymous officials.
52. Ibid.
53. Text of the Lahore Declaration (February 21, 1999), Internet: http://www.indianembassy.org/South_Asia/Pakistan/lahoredeclaration.html.
54. *Draft Report of National Security Advisory Board on Indian Nuclear Doctrine* (August 17, 1999), Internet: http://www.indianembassy.org/policy/CTBT/nuclear_doctrine_aug_17_1999.html; Habib Khan Ghori, "Nuclear missiles for subs under study: Pakistan Navy," *Dawn* (Pakistan) (February 22, 2001); "Pakistan Nuclearising its Navy," *The Times of India Online* (January 10, 2001).
55. List of points as they appear in Memorandum of Understanding (February 21, 1999), Internet: http://www.indianembassy.org/South_Asia/Pakistan/mou (lahore01211999).html.

56. Text of the Joint Statement issued at the end of the Prime Minister Atal Bihari Vajpayee's visit to Lahore (February 21, 1999), Internet: http://www.indianembassy.org/pic/PR_1999/February99/prfeb2199.html.
57. "Pakistan informs India about missile test," *The Nation* (Pakistan) (April 14, 1999); "Pakistan to Test Missiles," *Dawn* (Pakistan) (May 25, 2002), Internet: http://www.dawn.com/2002/05/25/top1.htm.
58. President General Pervez Musharraf's Address to the Nation (January 12, 2002). The full text of this speech is available on the Pakistan ministry of foreign affairs website at http://www.forisb.org.

This page intentionally left blank

II

Avoiding the Nuclear Threshold

This page intentionally left blank

4

Missiles and Nuclear Risk-Reduction Measures

W.P.S. Sidhu

India and Pakistan coexist in a state of violent peace or "ugly stability,"[1] in which friction points manifest themselves in different forms, including low-intensity conflict and border skirmishes, medium-intensity conflict in a localized area, and high-intensity conflicts in a localized area.[2]

Between December 1971, when India and Pakistan fought their last full-fledged war, and May 1998, when both India and Pakistan conducted nuclear tests, there was a series of crises, particularly in 1983–1984, 1986–1987, and 1990, all of which stopped short of full-scale war. These crises were played out against the emerging nuclear scenario in the Subcontinent. The absence of war during this period was attributed to the tacit belief of each side in the other's veiled nuclear weapons capability. This opaque nuclear scenario has been described variously as "recessed deterrence," "non-weaponized deterrence," or even "existential deterrence."[3]

However, after the May 1998 tests it could be argued that the demonstrated capability to use nuclear weapons has added a new and unknown element to the existing state of violent peace. Although this perception is primarily premised on the nuclear weapon capability, both missile and aircraft-based delivery systems are also important components of any nuclear arsenal. Thus, the presence of both missile and aircraft-based delivery systems is also regarded as a vital component of the brand of deterrence and violent peace between India and Pakistan.

Many optimistic scholars argued that weaponization of the hitherto unexercised nuclear capability in South Asia is a welcome development, as it will lead to peace and strategic stability.[4] They asserted that an overt nuclear status would remove the ambiguity and uncertainty that were implicit in the non-weaponized status of both India and Pakistan. An overt nuclear status would provide both certainty and stability. Moreover, these experts argued, possession of nuclear weapons would eliminate the possibility of war, including conventional war, as both India and Pakistan would be reluctant to launch a conventional war for fear that it might escalate into a nuclear

exchange. Thus, Kenneth Waltz wrote, new nuclear states locked in hostile pairs will be forced to deal cautiously with each other.[5] In fact, instead of tension, the nuclear capability will lead to "possibilities for a less worried and more relaxed life."[6] Similarly, Devin Hagerty in his detailed study of the 1990 Indo-Pakistani crisis, argued that the past practice in South Asia "indicates that in the area of crisis stability, the logic of nuclear deterrence is more robust than the logic of nonproliferation."[7] He concluded: "The 1990 Indo-Pakistani crisis lends further support to the already impressive evidence that the chief impact of nuclear weapons is to deter war between their possessors."[8]

This view is not unanimous and has been challenged by nuclear pessimists who felt that the nuclear weapon capability had not created strategic stability.[9] Eric Arnett, for example, argued that the continued emphasis on planning for a conventional war was an "indication that Indian military planners do not take the Pakistani nuclear capability seriously."[10] While accepting that the nuclear capabilities might be "deterrence stable," Kanti Bajpai cautions that they are not "crisis stable." In fact, notes Bajpai, "nuclear capability on both sides of the border has made the region positively safe for insurgencies aided and abetted by outsiders."[11] Hence, this group argued that the induction of nuclear-capable missiles and nuclear-capable aircraft (which are also capable of delivering advanced, conventional, precision-guided munitions) are particularly destabilizing for three reasons. First, nuclear capabilities do not help resolve ongoing conflicts. Second, were an attempt made to resolve the conflict with conventional means, the situation might escalate to the nuclear level, particularly as the delivery systems could be used for both conventional and nuclear roles. Third, there is the inherent danger of the inadvertent or accidental use of the nuclear weapon capabilities. While neither stability nor instability arguments can be proven, what does emerge from this debate is that the attempt to move from a non-inducted and non-deployed stage to one where nuclear-capable missiles are inducted and deployed adds a new and unknown dimension to the already tense standoff between India, Pakistan, and China, creating a potentially dangerous situation.[12]

The Kargil confrontation of 1999, which erupted less than a year after the nuclear tests, underlined precisely the inherent danger in such a transition.[13] Unlike the past (where there might have been some doubt about the nuclear weapons capability of the other), in this episode both sides were well aware of the presence of nuclear weapons in each other's arsenal. In fact, according to one account, India is reported to have prepared some nuclear weapons for delivery during the course of the conflict.[14] Similarly, Pakistan is reported to have moved its missiles into launch positions.[15] Second, in the South Asian context, this was the first time since 1984 (when India acted preemptively to occupy the Siachen Glacier area) that one side had occupied a disputed territory. The Pakistani action of crossing the Line of Control (LoC) in the Kargil area of Jammu and Kashmir signaled a major breakout and challenged the relative stability that had been established under the non-weaponized deterrence relationship between the two antagonists since the early 1980s. Finally, Kargil was different because it was the longest, and perhaps bloodiest,

military confrontation which did not end with a bilaterally negotiated peace treaty. To a large extent the crisis was resolved at the behest of a third party—the United States. Thus the Kargil conflict was, perhaps, the first confrontation between two nuclear weapon states that was not resolved bilaterally but by another nuclear weapon state.

The Kargil crisis shattered at least two assertions postulated by nuclear optimists. First, the belief that going overtly nuclear automatically ensures the cessation of all conflict—conventional and nuclear—and leads to the creation of strategic stability between two adversaries, has been shaken.[16] Following the Kargil crisis of 1999 and the eyeball-to-eyeball confrontation in late 2001–early 2002, which came in the wake of the attack on the Legislative Assembly in Srinagar on October 1, 2001, and on the Indian Parliament on December 13, 2001, by terrorist groups reportedly operating from Pakistan, this belief too has been upset. In fact, Kargil showed that an overt dyad nuclear relationship is not inherently stable but can lead to situations where it may actually provoke one or both sides to take steps to undermine stability. Second, the belief that a conflict can be maintained at the conventional level without going nuclear has also been brought into question. While India's defense minister George Fernandes has cited the Ussuri River clash between China and the Soviet Union in 1969 to justify and promote the concept of "limited war," and reaffirmed the need for adequate conventional military capability so as to "ensure that conventional war... is kept below the nuclear threshold,"[17] this concept has not been accepted by Pakistan. Indeed, at a press conference on June 1, 2002, Pakistan's ambassador to the United Nations, Munir Akram, cautioned that Pakistan could resort to the use of nuclear weapons even in a conventional conflict if Pakistan considers the losses to be unacceptable.[18] Given the linkage in South Asia between missiles and nuclear weapons, there is a distinct possibility that even the use of conventionally armed missiles in a nonnuclear confrontation might prompt a nuclear exchange.

In this regard, the confrontation of 2001–2002 witnessed dangerous escalation by India and Pakistan both in terms of statements and actions. While India mobilized its conventional strike forces and publicly contemplated pursuing a "limited war," India's prime minister, Atal Behari Vajpayee, issued what can only be described at a nuclear threat. Speaking in Lucknow on January 3, 2002, he declared, "... no weapon would be spared in self-defence. Whatever weapon was available it would be used no matter how it wounded the enemy."[19] Within days of this statement India also test-fired the 700 km range Agni-I on January 25, 2002. Although Islamabad was notified of the test, this launch was clearly regarded by Islamabad as an attempt to intimidate Pakistan. Subsequently, Pakistan's president Pervez Musharraf also issued a nuclear threat in April 2002 and in late May 2002 three surface-to-surface ballistic missiles of the Hatf series, the Ghauri, Ghaznavi, and Abdali, were test-fired.[20] The nuclear brinkmanship was further compounded by both sides closing down their official channels of communication and not allowing any back channel of communication (which was

one factor that prevented the escalation of the Kargil crisis). In this scenario, it was left to some countries, notably the United States and Great Britain, to convey their alarm by asking their nationals to withdraw from both India and Pakistan. Eventually, high-level shuttle diplomacy primarily on the part of Washington helped to prevent a war.

Clearly, both India and Pakistan are still trying to grapple with making deterrence based on overt capabilities work and are learning to practice deterrence through a series of crises. The situation is likely to become even more complex if the China factor is also taken into consideration.[21] Similarly, the presence of U.S. troops, particularly in Pakistan, is likely to be a consideration for Indian and Pakistani planners as they contemplate their deterrent relationship.[22]

Additional complications arise with the deployment of nuclear-capable missiles. First, despite the series of tests these missiles are relatively new weapon systems. Very little is known about their capabilities or performance. For instance, the Prithvi was initially designed to be conventionally armed but has now been declared nuclear capable. According to the original specifications, the Prithvi was "designed to meet the requirements of artillery to engage targets beyond the range of field guns and unguided rockets" and can carry five interchangeable conventional warheads. These include pre-fragmented monolith; bomblet sub-munitions; incendiary; blast-cum-shock sub-munitions; and practice. The Prithvi has been compared with the conventionally armed Soviet TOCHKA and the U.S. Army Tactical Missile System (ATACMS) tactical surface-to-surface missiles.[23] After the tests in May 1998, however, the chief of the Defence Research and Development Organisation (DRDO) Avul Pakir Jainulabdeen Abdul Kalam declared that Prithvi was also nuclear-capable.[24] Thus, presently the Prithvi would be presumed to have a dual role, making it difficult for the other side to ascertain its payload.

Second, how will these missiles be used? Although both India and Pakistan clearly used them (particularly the nuclear-capable Agni and Ghauri) to move up the escalation ladder during the Kargil and 2001–2002 crises, it is not clear how the other side interpreted these signals. While India has asserted that the Prithvi will be used only against military targets, both static, such as airfields, and mobile, such as troop concentrations, the draft nuclear doctrine and the deployment patterns for missiles (particularly with conventional warheads) in crises suggest a proclivity for a preemptive strike doctrine. However, it is still not clear whether the Indian doctrine favors only an early use or whether it considers a late use once the conflict is underway. If it is the former, would the movement of the missiles close to the border signal an impending strike, as was perceived by Pakistan in 1997 when the Prithvis were temporarily "stored" at the frontier town of Jullandhar?[25] Also, while there would clearly be a different doctrine of deployment and use for the nuclear-tipped (a second-strike against countervalue targets) and conventionally tipped missiles (an early or first-strike against counterforce targets) how would these differences be conveyed to the adversary? And what is the guarantee that the other side will read signals properly?

Third, since these missiles are a new phenomenon and have never been used in combat, there is only marginal understanding about their movements, unlike the case with conventional weapon systems. In the case of tanks, for instance, both sides know their exact peacetime, training, and forward locations and can reliably forecast whether the armor is preparing for training or war. Therefore, tanks west of the Indira Gandhi canal cause concern in Islamabad, while a concentration of Pakistani armor in the Shakargarh bulge area rings alarm bells in New Delhi. This is not the case with missiles as their peacetime, training, and forward locations are still being worked out and remain opaque to the other side. Also, as both sides have never deployed missiles before, neither side can be entirely sure whether a movement is designed to be aggressive or benign. Any movement of the missiles, particularly close to the border, during a severe crisis could signal belligerence as well as deterrence. A series of repeated crises where the missiles are moved about will certainly establish a library, but each crisis has different characteristics. The inherent risks of such moves could lead to a preemptive response by either side, and may well trigger an inadvertent conflict.

While there are many legitimate reasons for India, Pakistan, and China to flight test, move, induct, and deploy missiles, some movement along these lines could also heighten a crisis and raise the possibility of conflict. The dilemma facing India and Pakistan is how to learn more about "using" missiles without unnecessarily escalating regional tensions. This essay argues that both countries could manage this contradiction and prevent miscalculation by providing each other with reliable monitoring and assessment of missile-related moves. Indeed, it may be in their national security interest to do so. However, given the current state of acrimony and deep suspicion in the region on these matters, greater transparency will be hard to put in place.

This essay begins with an overview of the political, technical, military, and security drivers behind the Indian nuclear missile program. It notes that India's missiles are a symbol of prestige and domestic pride; are driven by a technical impetus; have a valid military rationale; and are a legitimate response to the regional and international situation, which has a direct impact on India's security concerns. It then elaborates on the role that nuclear risk-reduction measures (NRRMs) could play in enhancing security and reducing the possibility of accidental nuclear escalation.

Symbols of International Prestige and Domestic Pride

India regards its nuclear and missile programs as vital symbols of prestige for three reasons. First, they are touted as evidence of the nation's technical prowess and scientific competence, especially when compared with the low level of technology and development in other sectors, such as energy and infrastructure. Thus, according to one account, "[i]n a country where the bullock cart still constitutes a principal mode of transportation, India's space program stands out as a dramatic achievement."[26] This program, as nearly all

writers point out, helps to elevate India to the level of the world's leading developed nations. Hence, in 1980 when the Rohini-I satellite was placed into orbit by the Satellite Launch Vehicle, Indian officials and articles made a pointed reference to the fact that India was the sixth to join the "exclusive club" of countries that have orbited satellites with indigenously produced launch vehicles.[27] Similarly, following the maiden flight of the Agni intermediate-range ballistic missile (IRBM), several articles noted with pride India's entry into the "exclusive" missile club of half a dozen countries.[28]

Second, pride in the missile program is even more cherished because these capabilities were developed despite concerted efforts, particularly by the existing members of this exclusive club, to prevent India from acquiring the necessary technology through a series of technology control regimes. Any sign of India succumbing to the opposition is seen as a sign of political weakness, if not an antinational sellout. For instance, when the third Agni flight test was delayed, commentators chided the government for giving in to external pressure.[29] Therefore, the continuous development and improvement of missile technology is not only essential to prove India's technological capability but also to challenge the exclusive nature of the missile club and the technology control regimes, which India considers to be discriminatory. In fact, one of the official mandates for defense research is "to develop critical components, technologies . . . and to reduce the vulnerability of major programs [such as missiles] . . . from various embargoes/denial regimes, instituted by advanced countries."[30] Thus, Indian programs are also designed to reduce the impact of a sanction regime.

Third, India's fight for membership in the exclusive club has also convinced New Delhi that it is imperative to acquire these technologies and capabilities, and to become a member of the select few in order to be taken seriously. In this context, Indian analysts argue that nuclear weapons (and related missiles) are currencies of power, pointing out that the five permanent members of the UN Security Council (UNSC) are also the five officially recognized nuclear weapon states. Unless the proposed expansion of the UNSC proves otherwise, or unless one of the existing permanent members dismantle their arsenal, India is convinced that nuclear weapons are essential to become a permanent member of this crucial executive world body.

The prestige element of these programs also resonates in domestic politics. For instance, domestic political considerations were primary factors behind Prime Minister Indira Gandhi's decision to give the green signal for the 1974 "peaceful nuclear explosion." Despite the dramatic victory against Pakistan in 1971, Mrs. Gandhi's party witnessed a drop in its popularity in the 1972 general elections.[31] The nuclear test was used to bolster her position by representing it as a major achievement for India, which in turn was identified with the ruling Congress Party.[32] Similarly, the Rajiv Gandhi government ran advertisements in the run-up to the 1989 elections, acclaiming India as a great nation capable of manufacturing the Agni missile.[33] In another telling incident, politicians accompanying the then defense minister Sharad Pawar to witness the second Agni test on May 29, 1992 (which failed

to meet the test parameters) asked the missile scientists to declare the test as a "success" for domestic political consumption. This test was later described as "partially successful."[34]

Thus, if governments with clear majorities use the achievements in strategic areas to strengthen their domestic political standing, minority governments find it no less important to not only use these symbols of prestige for improving their domestic position, but also to support what is described as "nuclear nationalism."[35] This was evident during the Comprehensive Test Ban Treaty (CTBT) negotiations. Both the P.V. Narasimha Rao and H.D. Deve Gowda governments had to show unwavering support towards India's strategic enclave (and oppose the CTBT) when the opposition parties accused them of compromising national security if they signed the Treaty.[36] Similarly, following the May 1998 tests, Prime Minister Atal Behari Vajpayee coined a populist slogan: *Jai Vigyan* (hail science) in line with the *Jai Jawan* (hail the soldier) and *Jai Kisan* (hail the farmer), slogans of Prime Minister Lal Bahadur Shastri after the 1965 Indo-Pakistani War and the success of the green revolution. The landslide election of A.P.J. Abdul Kalam as the eleventh president of India in July 2002 is yet another indication of the prestige associated with the nuclear and missile programs.[37]

The Technical Impetus

Although the Prithvi and Agni are now regarded as symbols of the nation's technical prowess and military strength, their origins were humble and even frail. This is evident in the study of the origins and history of the Defence Research and Development Laboratory (DRDL), the birthplace of the Prithvi and Agni missiles. On January 1, 1958, the DRDO was formed through the amalgamation of the Defense Science Organisation and the Technical Development Establishment.[38] At present, DRDO comprises 50 laboratories and establishments (including the DRDL), employs about 30,000 people, and conducts research and development in aeronautics, special materials, armaments, electronics, specialized medicine, food, clothing and, of course, missiles.[39] The military missile program was deliberately separated from the civilian Indian Space Research Organization (ISRO) right from its inception. In fact, DRDL, Hyderabad (the primary laboratory involved with missile research) actually pre-dates the civil space program by at least four years.[40] And, according to one U.S. intelligence assessment, the two programs "compete for resources."[41] However, this did not prevent cooperation or transfer of technology and, occasionally, personnel from one program to the other.[42] In the two decades leading up to the early 1980s, DRDL had "established the basic technology required for missile systems in solid and liquid propulsion, control and guidance and precision fabrication."[43] According to one commentator, "In sum, an indigenous capability exists for developing almost all missile sub-systems, but in isolated pockets. What is now needed is horizontal integration among the various organizations and a determination to utilize the scientific capability available in the

country in a planned and systemic way."[44] This "horizontal integration" came in the wake of the successful SLV-3 launch by ISRO and the return of Abdul Kalam from ISRO to DRDO.

Soon after Abdul Kalam moved to DRDO as director of DRDL in 1982, the laboratory announced the launch of the ambitious Integrated Guided Missile Development Program (IGMDP) to develop five new missiles. These missiles could be divided into two distinct groups—"tactical-conventional" and "nuclear-capable strategic." On the tactical front, there was a proposal to develop an advanced antitank guided missile, the Nag, and two surface-to-air missiles (SAMs)—the Trishul and the Akash. The Trishul was to meet the requirements of all the three services—the army, the navy, and the air force—and was a short-range, quick response SAM. Although the Akash was billed as a Patriot-type SAM, it is closer to the Soviet SA-6 "Gainful" missile.[45]

On the "nuclear-capable strategic" side, there was the Agni technology demonstrator—a two-stage, solid-and liquid-fueled IRBM that was not built to any service requirement. The missile was designed to carry a one-ton nuclear warhead to ranges between 1,500 and 2,500 kms, although in the three tests since its first flight in 1989, its range was much shorter. After an Agni flight test in 1994, it was announced that the current testing phase was completed. The second phase of the Agni development program was approved shortly before the May 1998 tests. The improved Agni-II, first tested in April 1999 and then again in January 2001, "is a huge stride in missile technology development—it uses a solid propulsion system . . . can be launched in 15 minutes . . . uses far more accurate navigational and guidance systems and is designed to operate on a highly mobile [rail] platform which lends flexibility and reduces vulnerability to strikes."[46] However, this missile, which was flight tested to a distance beyond 2,100 km in January 2001, is still considered inadequate to deter China. With its present range the missile "can at best cover Chinese territory till the western cities of Chengdu and Kunming" and cannot strike either Shanghai or Beijing.[47] Hence, India is developing the 3,500 km range Agni-III, with new first and second stages, which is likely to be flight-tested in the near future. Meanwhile, on January 25, 2002, India successfully tested the nuclear-capable, single-stage, solid-fuel, road-mobile, 800–900 km range Agni-I, which "adds more teeth to India's deterrence posture."[48]

Finally, there was the Prithvi surface-to-surface missile (SSM) described as a "battlefield support missile." Its range, 40–250 km, puts it somewhere between the tactical and strategic bracket, especially in the India–Pakistan context.[49] The Prithvi is a single-stage, liquid-fuel missile that comes in three versions: the SS-150 with a range of 150 km and a 1 ton payload, designed for the army; the SS-250, with a range of 250 km, built for the air force; and the SS-350, which is still under development [50]

The success of the Prithvi and Agni should not be seen in isolation but in the broader context of the other ambitious DRDO projects, particularly the Arjun main battle tank (MBT) and the light combat aircraft (LCA), which were completed more than a decade behind schedule. The MBT project was

launched in 1974 and the first prototype was planned for 1980. The design, however, was finalized only in July 1996 and the earliest the first batch of Arjun Mk.1 MBTs are to be delivered to the Army during 2003/04.[51] Similarly, the LCA was commissioned in 1983 with a view to replacing the MiG-21 fleet by the mid-1990s. However, its first test flight took place only in January 2001 and the most optimistic date for its entry into operational service is 2010.[52] Against this background, the Prithvi success was critical for the continued funding and patronage of DRDO by the political establishment. It is no coincidence that the person chosen to succeed Dr. V.S. Arunachalam as the head of DRDO in 1993 was none other than Abdul Kalam, the chief of the IGMDP. With his prior record of success, Abdul Kalam was rightly considered to be in a strong position not only to promote the missiles, but also to ensure support for the other DRDO projects.

The Military Impetus

Around the time that the IGMDP was launched, the armed forces were in the process of revising their tactics and doctrines, partly on account of the induction of new equipment, and partly in response to the changing geopolitical scenario in the region. This pattern of evolution was evident in all three services in the early 1980s.[53] According to some military experts, this reflected a shift from the traditional passive and reactive doctrines of the Indian armed forces to a more offensive and preemptive doctrine.[54]

Two basic nuclear concerns have preoccupied Indian military strategists since 1964: How to counter a nuclear threat—initially from China and then from Pakistan—by conventional means,[55] and the possible role of nuclear weapons in the Indian Army, if the weapon option were to be exercised.[56] Indian strategists have tried to evolve new doctrines that would meet both the conventional and nuclear threats with existing hardware. This is evident in the draft nuclear doctrine prepared by the National Security Advisory Board and released on August 17, 1999. The doctrine emphasizes both the civilian control of nuclear weapons as well as the critical role of conventional weapons in keeping any conflict below the nuclear threshold.[57] Hence, nuclear doctrines are not seen as separate from conventional doctrines, but as an adjunct to them. Accepting that the effects of nuclear fallout could be minimized even by conventional means, the armed forces also argued that conventional means were not adequate and that nuclear weapons could be effectively deterred only by other nuclear weapons.[58]

With the start of the Prithvi program, the army saw its opportunity. By using it as a test bed, the army would be in a position to induct nuclear weapons. Traditionally, armies have acquired nuclear weapons through the acquisition of surface-to-surface guided missiles with an approximate range of over 100 km. This was certainly the case in the U.S. Army, which acquired the Corporal-guided SSM to deliver either a nuclear or high explosive warhead up to a range of 75 nautical miles. Similarly, by putting out a General Staff Quality Requirement for the Prithvi (the army was reportedly the first

service to make a bid as early as 1983–1984) it also fulfilled a long-standing desire, first articulated in the mid-1960s, after the Chinese test, for tactical nuclear capability. While the present Prithvi configuration is purely conventional, the army version of the SSM has adequate throw weight to mount a 1-ton nuclear device, paving the way for the induction of nuclear weapons.

Although this capability created a host of other tactical problems—such as the inability to acquire real-time targeting information deep across the border and the use of toxic liquid fuel under possible enemy fire—the army remained keen on putting its weight behind the program.[59] However, the successful test of the solid-fuel Agni-I (which is well suited for the India–Pakistan context) indicates the possibility that the army and the other services would prefer the Agni-I to the Prithvi as a nuclear delivery system. In this case either the Prithvi would be relegated to a purely conventional role or there is a possibility that it might even be phased out entirely.

Like the army in the 1980s, the Indian Air Force (IAF) also followed a two-pronged policy with regard to nuclear weapons. One was a conventional defense against nuclear weapons (which included conventional strikes by aircraft and possibly missiles against nuclear installations, nuclear weapon sites, and nuclear delivery systems) and was very much in line with the national policy of keeping the weapon option open. Air Commodore Jasjit Singh, a former fighter pilot and the former director of the Ministry of Defense (MoD)-funded think tank, the Institute for Defense Studies and Analyses (IDSA), elaborated:

> Air Power alone has the attribute of transcending natural and national barriers and apply [*sic*] destructive force at the critical time and place. The air strategy, therefore, must exploit this attribute to the maximum to provide credible, effective deterrence against aggression. This would naturally be based on conventional capabilities in view of the basic national policy with regard to nuclear and chemical weapons. But even at the conventional plane strategic offensive capabilities provide the means of deterrence both through denial as well as punishment.[60]

The IAF also sought to pave the way for the possible induction of nuclear weapons into the service by demanding the creation of a strategic air command or an aerospace command to pool the resources for reconnaissance, target acquisition, and strike. Again, according to Jasjit Singh

> The fundamental basis of the air strategy must remain deterrence. To effectively implement it, there is a need to create a Strategic Air Command of IAF where aircraft (like the Jaguar) missiles (like the Agni and Prithvi) and strategic reconnaissance and intelligence collection systems would be possible from within existing resources.

Air Chief Marshal S.K. Mehra also echoed this in 1990.[61] Here, too, the debate picked up after the successful launch of the Prithvi and Agni missiles. The limited public information available indicates that in the early 1980s while senior IAF officers spoke of deterrence based on the "induction

of high-technology," this did not include nuclear-capable missiles and was confined only to modern aircraft.[62] Thus, while the air force made a pitch for and acquired both the MiG-29 and the Mirage 2000, they did not make a bid for the Prithvi or Agni in the early 1980s. In fact, even after the army had put in their General Staff Quality Requirements, and the Prithvi had been successful tested in 1988, the IAF had to be virtually coerced into placing orders for the conventionally-armed missile.[63]

There were several reasons for this reluctance. First, the IAF, like most air forces, is dominated by fighter pilots, who hold key decision-making positions—and fighter pilots derive their prized position from flying fighter aircraft. To that extent, the pilots would be hesitant to shape a force that was based on anything apart from fighters. This feeling of being sidelined professionally was further accentuated by the government dicta that the cost of the Prithvi force would be borne by the service, making the missiles a direct competitor to the fighters. Second, while some scientists and policy makers argued that the cost of hitting a target with a conventionally armed Prithvi missile would be cheaper than using a squadron of aircraft, air force officers have challenged this assertion.[64] They argue that modern precision-guided munitions carried by strike aircraft are not only far more accurate, they are also more economical than the present Prithvi missiles. However, the cost factor swings in the favor of Prithvi missile if it is nuclear-tipped.

Third, by the time of the Prithvi test flight in 1988, India and Pakistan had signed an agreement not to attack each other's nuclear installations, thereby removing the one obvious class of targets against which a Prithvi armed with a conventional warhead could be used. Hence, there was no urgency to acquire the missile, although the solid-fuel Agni-I might make the IAF reconsider its position. Finally, the Prithvi is a "Pakistan-specific" missile, and the current IAF fleet provides relative strategic parity, if not superiority, against Pakistan's air force. However, the IAF lacks similar capability vis-à-vis China and could use a long-range missile, such as the Agni, in its arsenal. Yet, the Agni is some way from being operational at least in the China–India context.

The External Impetus

Although the IGMDP was initially launched on account of indigenous factors, the program was also influenced by the deployment and use of similar missiles—particularly the conventionally armed SSMs—in the Arab–Israeli and Iran–Iraq wars. This was the first time that armed forces similar to the Indian military had employed missiles. Although Germany had used missiles in World War II it had done so primarily to strike terror among civilians, rather than to destroy military targets. In the 1973 Arab–Israeli War, an attempt was made to use these missiles in a military role. Similarly, even during the Iran–Iraq War, missiles were originally used against military targets. Although their effectiveness as weapons of war has been questioned, there are indications that in at least some cases, SSMs armed with conventional

warheads could prove decisive in a battle.[65] For instance, in the Afghan civil war in the 1990s, the barrage of SCUD missiles used by the government forces may have been instrumental in breaking the siege of Jalalabad, held by rebel forces. Similarly, during Operation Desert Storm in 1991, the United States effectively used 32 ATACMS missiles against Iraqi SAM sites, logistic sites, artillery and rocket battery positions, and tactical bridges.[66] The use of the Tomahawk cruise missiles in August 1998 against suspected terrorist training camps in Afghanistan validated the capability of such weapons against a variety of targets.

Similar targets have been identified for the Prithvi and other improved missiles. Indeed, the designers of Prithvi have consistently compared the Indian missile to the ATACMS and the Russian TOCHKA missile system, arguing that the accuracy of the Prithvi is comparable to these systems.[67] In fact, some military analysts have argued that neither the ATACMS nor the M-11 has shown the same accuracy in test firing as the Prithvi.[68] Even if this is an exaggerated claim, there is no doubt that with an improvement in its accuracy, the Prithvi would be accurate enough to take on the role assigned to the ATACMS during Operation Desert Storm. In order to improve its performance and accuracy, however, the Prithvi will have to be further developed and tested. The same is true of the Agni missile. While the present Agni variants are not likely to be effective conventional weapons, an intense program of development and testing could improve their accuracy to this end.

Conventionally armed missiles may have political as well as military purposes. This was illustrated in 1996 at the time of the Taiwanese presidential elections when China fired several missiles toward Taiwan as part of a military exercise. Although this move did not affect the outcome of the elections, it did make the new leadership cautious about declaring independence from China. Moreover, the monetary incentive of exporting missiles is equally tempting. For instance, China earned an estimated US$2.5 to 3.5 billion for supplying DF-3 IRBMs to Saudi Arabia. The sale of 100 SCUDs to Iran by North Korea earned Pyongyang approximately US$500 million.[69] Thus, selling similar missiles could be an important external impetus for hard-currency strapped countries like India, particularly if the present economic reforms come to a standstill.

Finally, there is another role that India's missile capability could play in the international arena—that of a bargaining chip. This strategy is reflected in the writing of some Indian strategists. For instance, Air Commodore Jasjit Singh, argues:

> . . . [I]t [India] should not hesitate to forego development and deployment of the Agni if states in the Asia-Pacific region initially, and in the world ultimately, are prepared to eliminate this class of weapons. This would be a far more effective and equitable approach than . . . the [Missile Technology Control Regime].[70]

Although this comment specifically refers to the Agni, a similar case is also plausible for the Prithvi in the Indo-Pakistani context. And to that extent,

the presence of the missiles, although seen as a part of the problem, might also contain the seed of a solution.

The Pakistan Factor

Pakistan first introduced different types of missiles into the battlefield.[71] India began to seriously examine the SSMs only after their use in the Iran–Iraq War and the reported interest that Pakistan had showed in similar missiles, tipped with chemical warheads. Some senior Pakistani military officials, such as former army chief General Mirza Aslam Beg, have argued that the Indian program is, in fact, in response to the Pakistani missiles.[72] However, the gestation period of five to eight years for missiles, such as the Prithvi and Hatf, and the appearance of the two in the late 1980s, seem to suggest that the two missile programs may have been launched around the same time—in the early 1980s. Although statements by Prime Minister Benazir Bhutto at the time of the successful launch of the 80 km range Hatf-I and the 300 km range Hatf-II in early 1989 seem to indicate that they were the fruition of a missile project initiated by her father, Zulfikar Bhutto, in 1974 on a "priority basis," in all likelihood, they were taken up in earnest only in the early 1980s.[73] And to that extent, the indigenous Pakistani missile program almost mirrors that of India's in its chronology.

While both the missile programs may have been initially driven by domestic, technical impetus—and possibly the knowledge of the other side's nascent missile quest—the appearance of similar missiles on the other side of the border certainly provided the post-facto rationale for the indigenous missile program. In the Indian case, this rational took on a more strident tone after the reported transfer of Chinese M-11 missiles to Pakistan. This is apparent in the assertion made by General Beg. It is also made explicit in the MoD annual report 1997–1998. According to the report, "China's assistance to Pakistan's nuclear weapons programme and the sale of missiles and missile technology to Pakistan also directly affects India's security."[74]

Thus, the appearance of missiles across the border was the perfect peg to hang the domestic quest for missiles. All the concerned parties—the defense scientists, the military, and politicians—used this external impetus to rationalize induction and justify a doctrine for missile deployment. The doctrine that the armed forces appear to be promoting is an extension of their doctrine regarding nuclear weapons. Simply put, the armed forces argue that nuclear weapons can best be deterred by nuclear weapons, and as a logical corollary, missiles can deter missiles.

The China Factor

The China factor has been a critical and constant element in the Indian security equation since the time of the 1962 Sino-Indian War, through the first Chinese nuclear test in 1964, and up through Indian Defense Minister George Fernandes' assertion that China is India's "potential threat number

one."[75] In the 1960s, soon after the Sino-Indian War and the start of the Chinese nuclear weapon program, China was considered the primary threat, preoccupying Indian strategists and politicians. This led India to embark on the subterranean nuclear explosion project, which culminated in the 1974 "Peaceful Nuclear Explosion." In the 1970s and in most of the 1980s, the Chinese threat was considered to be relatively dormant and was rarely raised by Indian officials who concentrated on the more immediate threat posed by Pakistan's emerging nuclear weapon program. In the late 1980s and 1990s, the China threat once again came to the forefront for a variety of reasons, even though India was relatively circumspect about highlighting it publicly.[76] Thus, while the China threat has always been in the background, it has been articulated with varying degree and intensity. This has depended on a number of factors, ranging from the Indian perception of the immediacy of the threat, which is based on intrusions and skirmishes along the LoC and reports of Chinese nuclear and missile activity (including missile transfers) that have a direct bearing on India's security, to the dynamics of the political personalities of the time.

The China threat can be divided into direct and indirect categories. China's own missiles and arsenals, particularly those capable of striking targets in India, pose the direct threat. The indirect threat is posed by China's supply of missiles to countries in India's neighborhood, such as Pakistan and Saudi Arabia; its technical assistance in the missile-related area, particularly to Pakistan; and the creation of bases and monitoring stations in other countries, such as Myanmar.

From India's point of view, Chinese missiles located on the Tibetan plateau pose a serious threat. The first nuclear weapons were reportedly brought onto the Tibetan plateau in 1971 and stationed in the Tsaidam (or Qaidam) basin in northern Amdo.[77] The earliest reports about nuclear missiles in Tibet were made by TASS (the Soviet News Agency) in 1974. It noted that "China has deployed radar and missiles with ranges from 600 to 2,500 miles in areas bordering India, thus putting most of India's towns, industrial centers and dams within range of Chinese missiles."[78] Another report identified these as the CSS-1 (Dong Feng [DF]-2) medium-range ballistic missiles (MRBMs) and CSS-2 (DF-3) IRBMs, which were first deployed in the mountainous caves and valleys of the Tibetan Autonomous Region in 1974.[79] According to later reports, by 1977 China had deployed some 70 CSS-1 MRBMs with a range of 950 km and 20 CSS-2 IRBMs with a range of 2,400 km at Nagchu (or Nagchukha), about 320 km northeast of Lhasa, Tibet's capital. These missiles were transported to this base in ten-wheeled transporter-erector-launcher vehicles. This base had the capability of destroying targets in Irkutsk, Mongolia, as well as New Delhi and other cities in India.[80]

Subsequent reports revealed that the CSS-3 (DF-4)—China's first ICBM—had been located in the Tsaidam basin. The Tsaidam sites reportedly have two missiles stored horizontally in tunnels near the launch pad. Fuel and oxidizer is stored in separate tunnels with lines to the launch pad. Another missile base in the area is located at Delingha and reportedly houses

four CSS-4 (DF-5) missiles.[81] According to another estimate, three missile divisions have been deployed in the Lanzhou-Chengdu region.[82] In addition, an authoritative study of the Chinese nuclear and missile program identified Datong and Kunming as bases for the CSS-5 (DF-21) missiles.[83] Subsequent U.S. intelligence reports confirm this.[84]

China, however, has consistently denied the presence of missiles in Tibet. In one such denial in 1987, the Chinese foreign ministry spokesman retorted that the report about China deploying medium-range missiles in Tibet against India, and about the alleged death of many Tibetans in work camps, was "nothing but a fabrication concocted with ulterior motives, not worth refuting at all."[85] Some Indian analysts have also questioned India's concerns about the Chinese missiles in Tibet. For instance, one argued that though the DF-3 has the range to hit India, they were "targeted at United States bases in the Philippines" and noted that these "missiles are now obsolete."[86] This analyst also asserted that the plan to develop the DF-25 with a range of 1,700 km to replace the DF-3 has been abandoned.[87] The lack of transparency makes it difficult to ascertain China's missile deployment and to assess the extent of the threat China poses to India.

Clearly, it is difficult to assess accurately the direct threat posed by Chinese missiles based in Tibet for a number of reasons. First, China has never publicized either the strength of its missile force nor its location. On the contrary, Beijing has been "very effective in keeping secret the details" and "there remains uncertainty about the number of ballistic missiles deployed," which must be based on "best estimates."[88] Second, the Tibetan plateau, full of natural caves and manmade tunnels, is ideal to conceal missiles, most of which are based on transporter-erector-launchers and have been moved around to make them difficult to track or target. Third, India has not had the national technical means to track these missiles or pinpoint their locations, particularly in Tibet. India has had to depend on human intelligence, particularly Tibetan refugees or resistance fighters, who may have their own vested interest in over- or underestimating missile strengths. Finally, in the absence of a verification regime, there is no means of checking whether the missiles that China claims have been decommissioned have indeed been retired or simply redeployed and retargeted.

Ironically, the indirect threats posed by China are easier to enumerate for three reasons. First, the transfer of men and material outside China is easier to track, especially when the final destination is Pakistan where the level of Indian intelligence gathering is better than in Tibet. Second, China's missile-related exports are also monitored by other countries such as the United States that have far superior surveillance capabilities and are bound to track violations of the Missile Technology Control Regime. Finally, while China may be discrete with its transfers, the recipient countries may be tempted to boast about them.

China's assistance to Pakistan's nuclear and missile program is well documented.[89] The Central Intelligence Agency (CIA) has also publicly acknowledged it. In his testimony before the U.S. Congress in 1993, the

then director of central intelligence James Woolsey, noted:

> Beijing has consistently regarded a nuclear-armed Pakistan as a crucial regional ally and vital counterweight to India's growing military capabilities. . . . Beijing, prior to joining the [Nuclear Non-proliferation Treaty] in 1992, probably provided some nuclear weapons-related assistance to Islamabad.[90]

Subsequent reports suggest that Beijing may have also supplied additional components for the nuclear-capable M-11 missiles even after 1992. In fact, according to U.S. observers, Beijing may have transferred an entire M-11 production plant to Pakistan.[91] In August 1995, the Lok Sabha's Standing Committee on Defense acknowledged the importance of these developments for India's national security. The Committee noted,

> "China is the main source of missiles and allied technologies for Pakistan. With both these countries we have unsettled boundary disputes," and therefore, "India has no option but to continue to develop and upgrade its missile capability."[92]

Although Indian officials have been particularly subdued in their response to the test of the Ghauri missile by Pakistan in April 1998, arguing that the Prithvi missile was adequate to deter Pakistan, they were quick in accusing China for its alleged assistance. Defense Minister Fernandes felt compelled to declare that "China is the mother of this missile" when he learned that the Ghauri missile, the latest of the Pakistani Hatf series, had been flight-tested.[93] Although it is likely that the Ghauri missile has a North Korean lineage, Chinese assistance in either facilitating the transfer or providing some critical components, such as the guidance system, have not been ruled out by Indian officials and analysts. Following the Ghauri test, India did not announce a retaliatory series of Prithvi tests, which is considered to be a "Pakistan-specific" weapon. Instead it reaffirmed its decision to upgrade the Agni missile, which is regarded as a crucial component of any future missile-based deterrent system to counter Chinese nuclear weapon capabilities.[94]

In the Sino-Indian case, however, Beijing and New Delhi have also taken some tentative confidence-building steps with regard to missiles following the signing of the Sino-Indian "Agreement on Confidence Building Measures in the Military Field along the Line of Actual Control in the India–China Border Areas" in 1996. Article III of this agreement stipulates the nonuse of military capability and requires the reduction or limitation of the number of missiles (both SSMs and SAMs) along the border areas to a level "mutually agreed upon."[95] However, neither side has embarked upon detailed negotiations to discuss either these mutually agreed levels or the related verification mechanisms.

Overt Deployment?

After the series of nuclear tests in May 1998, Defense Minister George Fernandes asserted that Indian missiles would be nuclear-tipped.[96] Although it may appear to some that the deployment of the Prithvi and Agni missiles

is a foregone conclusion, and that "weaponization is inevitable," these objectives are still some way off in becoming a reality.[97] Deployment, as it is generally understood, would entail making the missiles fully operational, handing them over to the military, moving them forward, taking them off the current de-alerted status, and putting them on high alert. Although there are some indications that some Indian missiles might well have been "deployed" during Kargil and the 2001–2002 crises, there is no evidence that this deployment is permanent. While technically the Prithvi may be closer to a stage of permanent deployment than the Agni, there are still several hurdles—both institutional and operational—that need to be crossed before both these missiles could be considered ready for operational deployment. These include economic costs, tactical command and control issues, and the international repercussions of an overt deployment. Moreover, it is not clear whether Fernandes was speaking only on behalf of the armed forces or whether he was expressing the consensus view of the Indian government. The indications are that he was representing the former rather than the latter.

There are, however, several possible advantages that could accrue from an overt deployed posture. One advantage could relate to strengthening deterrence by providing a mutually assured deterrence posture. Second, because missiles would already be deployed during peacetime, the tensions associated with taking this step during a crisis could be avoided. Third, the deployment of missiles could facilitate negotiation of a missile restraint regime. Fourth, deployments could promote a realistic debate over reasonable limits for missile forces. Fifth, deployments could increase willingness to pursue arms control and explicit bargaining as part of a national security strategy.[98] Indeed, senior Indian leaders hope that as both India and Pakistan have validated their nuclear weapon capability, they should be able to "settle their differences . . . peacefully and through negotiations."[99]

On the other hand, permanent deployment of nuclear-capable missiles could accentuate nuclear instability on the Subcontinent, especially if such deployments were perceived in the context of a quest for nuclear superiority or a first-strike capability. For instance, were India to deploy nuclear-tipped missiles close to the border these would undoubtedly be prime targets for a preemptive first strike by Pakistan. Consequently, India would have two choices: either to move toward a launch-on-attack or launch-on-warning first-strike mode (the so-called use 'em or lose 'em syndrome) or to continue an open-ended building of its nuclear missile arsenal to ensure that it retains a second-strike edge over Pakistan. While the former option would entail a high degree of pre-delegation, the latter option would ensure a spiraling arms race, as Pakistan would be compelled to match India's buildup missile for missile. Given the complete lack of early warning capability on both sides and the propensity toward false alarms, particularly in times of tension, pre-delegated authority would also make the set up prone to inadvertent launches. Moreover, were India to deploy permanently it might also be compelled to acquire anti-ballistic missile (ABM) systems.[100] Although such an acquisition might provide effective point defense to protect India's missile

and strategic arsenal, it would also lead to strategic instability, as Pakistan (which in unlikely to get similar systems) would feel compelled to buildup its strike force to saturate these point defenses.[101] As one assessment notes, "India's acquisition of missile defenses could upset the delicate nuclear balance" that is based on "a non-weaponized, largely untested and non-deployed nuclear capability," especially if an ABM system is introduced unilaterally.[102]

On account of all the above reasons, deployment, at least as it is understood in the military doctrines of other nuclear-weapon states, is likely to be delayed for as long as possible. While the armed forces are keen on weaponization, mating the warhead to the delivery system, and retaining control of the nuclear weapons, others—particularly the civilian bureaucrats of the MoD and scientists of the Atomic Energy Commission (AEC)—appear to be unwilling to hand over charge of the warheads to the military. The result is likely to be a "divided control" with the delivery system (such as the Prithvi missile) being under the charge of the armed forces and the warhead being kept by a separate establishment.[103] This arrangement reveals a preference for a non-deployed and de-alerted status rather than for an overt and high alert deployed status. Thus, any move to overt deployment would have to overcome significant institutional resistance, both inter-services and intra-services. Although one report suggested that India was indeed moving toward establishing and placing its missile-based nuclear arsenal under a new Strategic Nuclear Command by June 2002, it remains to be seen how effective this Command is likely to be in its day-to-day functioning, particularly in the crucial areas of operationalization and deployment of the nuclear arsenal.[104]

Induction Without Deployment?

An alternative scenario to deployment for India's nuclear-capable missiles could be a policy of induction without deployment. This plan would allow India to develop, test, and even induct the missiles without actually deploying them in an operational mode. This virtual de-alerted status is indicated by India and Pakistan being in the early part of the test, induct, and deployment cycle. A case in point is the Agni "technology demonstrator," which, in 1998, was in the development phase, took a long time to prepare for firing, was cumbersome to maintain, and could be launched from only one site. Thus, any attempt to operationalize the nuclear force around the earliest version of the Agni would make it highly visible and vulnerable to a decapitating first strike. Similarly, while the Prithvi could be made operational and deployed on a hair-trigger alert, its liquid fuel makes it difficult to handle and cumbersome to maintain over a long period of time. In addition, to use the missile effectively, particularly against moving military targets such as troop or armored concentrations, and to protect it against preemptive strikes, would require real-time surveillance capability and reliable command, control, communication, intelligence, and early warning systems, which India does not possess. While the testing of the solid-fuel Agni-II in 2001 and the

shorter range Agni-I in 2002 has indicated a growing capability to build and maintain an arsenal that can be both dispersed and launched quickly, many more tests are essential to ensure that these capabilities are fully validated before the missiles are deployed.

Additionally, India, and perhaps Pakistan, have followed a deliberate policy to maintain a de-alerted status in order to minimize the possibility of an accidental or inadvertent launch, and to adhere to a delayed launch procedure strategy. This effort has been attempted in two ways. First, by making a clear distinction between induction and deployment. Induction indicates a peacetime, nonbelligerent activity of acquiring a new weapon system and training with it at the unit level. Deployment implies a more warlike posture in which the weapons are actually placed on launchers and are kept ready for operational use at a forward location. This option is particularly relevant to short-range ballistic missiles, such as the Prithvi. In the case of longer-range missiles, such as the Agni, it could mean that the missile is made operational at a location from where it would not have the range to strike targets.

This policy may explain the long delay by the Indian armed forces to induct and deploy the Prithvi even though there is military utility in doing so. Although the missile was first successfully test-fired in 1988, the 333rd Missile Group was not raised until 1993, the missile was not displayed on Republic Day until January 1994, and the Indian army placed orders for 75 SS-150s only in May 1994.[105] Consequently, the Prithvi was inducted only in late 1994.[106] Moreover, if the shifting of some missiles to a storage site at Jullandhar in 1997 indicates deployment, as some have argued (though the missiles were subsequently moved back to Secundrabad, the home base of the 333rd Missile Group), the gap between induction and deployment was at least three years.

The virtual de-alerting of missiles in South Asia also provides a relatively economical method of protecting nuclear arsenals. Were the nuclear arsenal effectively deployed, it would have to be protected either by building hardened silos or by attempting to create an elaborate ballistic missile defense system, coupled with a sophisticated early warning system. Not mating the warhead with the delivery system would allow for the components to be dispersed and would also ensure a degree of survival against a preemptive attack. It would also resolve some of the command and control problems that New Delhi faces. Thus, the current scenario of induction without deployment appears likely to continue.

The present scenario could be formalized in the course of prospective bilateral dialogue between Islamabad and New Delhi. The chances of such a bilateral agreement would be increased if it were linked to a global de-alerting regime which covers all the other five nuclear weapon states. Thus, this pattern of delayed induction, storage, and deployment, and the adoption of a virtual de-alerted status in South Asia, could be exemplary for the other nuclear powers. This step would be acceptable to India, as it covers not only Pakistan, but China as well. However, if a global treaty does not materialize,

then it would be important for New Delhi to formalize such an agreement with Beijing as well as with Islamabad.[107]

Missiles and Nuclear Risk-Reduction Measures

Nuclear risk-reduction measures (NRRMs) are clearly relevant to either deployed missile forces or inducted but undeployed missiles in South Asia. India has had to learn from experience and create its own brand of crisis management and NRRMs to deal with nuclear dangers associated with missiles in South Asia. These arrangements, like those between the United States and the former Soviet Union, can emerge from a series of crises. The Indian experience, however, is a marked departure from that of the United States and the former Soviet Union, in that both of these countries were able to induct and deploy nuclear missiles at the tactical level soon after the end of World War II with a minimum of fuss, debate, or international opprobrium. In contrast, India has had to proceed with the rest of the world watching its every move.

Once India and Pakistan feel obliged to enter into NRRMs, they could choose from a variety of available options. These could range from prior notification of flight-tests, to declaratory measures of no first deployment, no-first-use, and non-attack of civilian targets. Additional NRRMs could entail concrete and verifiable steps to ensure that both parties were adhering to the agreements reached. This would depend on the perception of both sides about the danger posed by missiles. Perhaps initial arrangements that do not insist on verification are most likely to succeed, as was the case with the Agreement on the Non-Attack of Nuclear Facilities. The critical question is how to manage missile-related crises that might occur before effective NRRMs are in place.

One of the best means to do this is to communicate the perceptions of a crisis to the other side, either directly or indirectly. In 1986–1987, there was no direct bilateral communication for a crucial 45 days, exacerbating the crisis. During the 1990 crisis, both India and Pakistan were in constant touch with developments on the other side indirectly through the respective U.S. ambassadors.[108] Similarly, during the 1999 Kargil crisis India and Pakistan had not only established a back channel of communication but had also conveyed their intentions through a third party—the United States. These contacts helped provide a relatively accurate perception of the intentions of the other side. A supplementary approach is to resolve the crisis as soon as it appears to be reaching a flashpoint. This has been the trend with all the major recent crises in South Asia. For instance, even though the Brasstacks crisis took a long time to brew, it was probably resolved in a single day (January 23, 1987) through a flurry of diplomatic activity in New Delhi and Islamabad.[109] Similarly, the 1990 crisis was well on its way to a resolution in April—weeks before the mission of U.S. Deputy National Security Advisor Robert Gates visited both capitals in May. And in 1997, a crisis over the

reported storage of Prithvi missiles in the Punjab near the Pakistani border was also resolved quickly when India decided to remove the missiles and send them back to Secundrabad.[110] Thus, before Kargil and the 2001–2002 crises, while crisis prevention appeared to be difficult, crisis resolution appeared to take place with alacrity, at least in the Indo-Pakistani context. However, the post-Kargil scenario has underlined the need to formalize both the crisis prevention and crisis resolution mechanisms.

One attempt at establishing formal NRRMs was evident soon after the May 1998 nuclear tests, during the so-called Lahore Process of February 1999. Prime ministers Vajpayee of India and Nawaz Sharif of Pakistan signed the Lahore Declaration on February 21, 1999, following a high-profile bus trip made by Vajpayee from Delhi to Lahore. Along with the Declaration, the Indian and Pakistani foreign secretaries signed a Memorandum of Understanding. This called for a resolution of Jammu and Kashmir in addition to measures to reduce the risk of accidental or unauthorized use of nuclear weapons, the need to implement "existing Confidence Building Measures," and the need to upgrade communication links between the two directors general of military operation.[111]

The Kargil crisis of 1999 effectively derailed the Lahore Process and even the high-profile Agra Summit in July 2001 between President Musharraf and Prime Minister Vajpayee could not put it back on track. In fact, the Agra Summit could not even arrive at an agreement on a joint statement describing the talks, let alone make substantive progress.[112] According to most observers, the Agra Summit might well have further damaged the process of normalization between the two countries.[113] Interestingly, despite the failure of the Agra Summit, India and Pakistan did not abrogate the Lahore Memorandum of Understanding, and have subsequently adhered to the prior notification of missile tests. In this regard, India and Pakistan are the only two countries apart from the United States and Russia that provide such notification. Similarly, despite the 2001–2002 confrontation and the suspension of rail, air, and road (including the new famous Delhi to Lahore bus service) links between the two, Islamabad and New Delhi did exchange the list of nuclear facilities on January 1, 2002.[114]

Missile-related NRRMs could be bilateral or multilateral. Some could be formal in nature and others informal. There are, in addition, unilateral NRRMs that India could enact to provide reassurance and reduce tensions arising out of missile tests and missile movements. Such movements are particularly alarming when one side fails to pick up the movement but learns about it from a story in a Western newspaper, as was the case in 1997 when Pakistan apparently learned that some Prithvi missiles had been moved to Jullandhar and stored there from a report appearing in the *Washington Post*. The same is also true with regard to missile flight-tests. Although there is no international or Western regime that prohibits missile testing or their movements within a nation's own territory, there appears to be a growing international norm against testing without prior notification. While the movement and flight-testing of missiles within one's own territory is a legitimate right

of any sovereign nation, this step could sound alarm bells. This development could be particularly alarming when test preparations have been detected without prior notification, and the weapons are considered to be nuclear-capable and part of a preemptive strategy. In the 1997 scenario, an Indian government sensitive to international opinion responded by reversing the move, which might have been designed merely to train the unit in the operational aspects of the weapon system at the actual forward locations. This sensitivity was the primary reason why the Prithvi missiles returned to their home base in Secundrabad at the risk of compromising a legitimate right to flight-test and induct missiles that are considered critical for national security.

Another unilateral or reciprocal NRRM that India and Pakistan could undertake to reduce tensions would be to provide prior notification of missile movement related to induction, as is occasionally done by the IAF when aircraft squadrons shift bases. This, however, is an unpopular option with the Indian Army, which is reluctant to share information that would reveal the operational and tactical maneuvers of their newest unit. A revelation about movement related to induction would be tantamount to giving Pakistan (and China) information that either or both might not otherwise have and would provide them with an opportunity to study the movements closely—information useful for a preemptive attack. Along this rationale, the Indian Army leadership initially declined to invite Pakistani observers to witness the Brasstacks exercises. However, the dangers associated with unannounced missile tests or movements are worthy of additional ameliorative steps.

Another possible NRRM is for India to clearly identify training areas and distinguish them from deployment areas within a range of targets. This norm has been achieved to a great extent in the case of both strike aircraft and tanks, but has not been achieved with missiles. Thus, India could unilaterally declare that missiles test-fired from the Interim Test Range at Chandipur-on-Sea, or even the ranges at Pokhran, are purely for testing and training purposes. This declaration would help to validate the distinction that India has diligently made between induction, training, and deployment. While a verification component would certainly go a long way to assure other side, it is unlikely to be adopted while there is continued tension.

Conclusion

The choices currently facing India and Pakistan are to overtly deploy, nuclear-capable missiles or to induct, but not deploy, missiles. This essay argues that non-deployed missiles in South Asia are conducive to nuclear risk-reduction and that a regime of missile stabilization measures and NRRMs are essential to provide reassurance and crisis stability. NRRMs would enable India to retain missile capabilities and reinforce legitimate security interests, while reducing the likelihood that these capabilities would be used inadvertently or would prompt a crossing of the nuclear threshold. While these measures would provide a modicum of stability even if missiles were eventually deployed, the real challenge would be to manage any crises

that arise in the interim. A series of innovative NRRMs are required, whether missiles are deployed or remain un-deployed.

Notes

1. The term "Ugly Stability" relates to the "Inability of Both India and Pakistan to Attain What May be Desired Political Objectives Through War." See Ashley J. Tellis, *Stability in South Asia*, RAND Documented Briefing (Santa Monica, CA: RAND Corporation, 1997), 5.
2. An earlier version of this essay was originally published in Michael Krepon and Chris Gagné, eds., *Nuclear Risk Reduction Measures in Southern Asia* report no. 26 (Washington, DC: The Henry L. Stimson Center, November 1998), 1–46.
3. See Devin Hagerty, "Nuclear Deterrence in South Asia: The 1990 Indo-Pakistani Crisis," *International Security* vol. 20, no. 3 (Winter 1995–1996): 87, for "existential deterrence;" George Perkovich, "A Nuclear Third Way in South Asia," *Foreign Policy*, no. 91 (Summer 1993): 86, for "non-weaponized deterrence;" and Air Commodore Jasjit Singh, "Prospects for Nuclear Proliferation," in Serge Sur, ed., *Nuclear Deterrence: Problems and Perspectives in the 1990s* (New York: United Nations Institute for Disarmament Research, 1993), 66, for "recessed deterrence."
4. The optimists have been identified in David J. Karl, "Proliferation Pessimism and Emerging Nuclear Powers," *International Security* (Winter 1996–1997), 88–90. They include Kenneth Waltz in Scott D. Sagan and Kenneth N. Waltz, *The Spread of Nuclear Weapons: A Debate* (New York: W.W. Norton and Company, 1995); Martin van Creveld, *Nuclear Proliferation and the Future of Conflict* (New York: Free Press, 1993); Peter R. Lavoy, "Civil–Military Relations, Strategic Conduct, and the Stability of Nuclear Deterrence in South Asia," in Scott Sagan, ed., *Civil–Military Relations and Nuclear Weapons* (Stanford, CA: Stanford University Center for International Security and Arms Control, June 1994), 79–109; and Devin Hagerty, "The Power of Suggestion: Opaque Proliferation, Existential Deterrence, and the South Asian Nuclear Arms Competition," in Zachary S. Davis and Benjamin Frankel, eds., *The Proliferation Puzzle: Why Nuclear Weapons Spread (And What Results)*, special issue of *Security Studies* 2, no. 3–4 (Spring–Summer 1993): 256–83 and "Nuclear Deterrence in South Asia."
5. Sagan and Waltz, *The Spread of Nuclear Weapons*, 10–17.
6. Ibid., 41.
7. Hagerty, "Nuclear Deterrence in South Asia," 84.
8. Ibid., 114.
9. Neil Joeck, *Maintaining Nuclear Stability in South Asia*, Adelphi Paper 312 (Oxford: Oxford University Press for The International Institute for Strategic Studies, 1997), 12.
10. See Eric Arnett, "Nuclear Stability and Arms Sales to India: Implications for U.S. Policy," *Arms Control Today* vol. 27, no. 5 (August 1997): 8, which looks at the offensive strategy of the Indian Air Force (IAF). More recently, however Arnett has conceded that the IAF's precision-guided munitions and offensive counter-air capability takes the Pakistani nuclear capability seriously and are designed to deny the Pakistan nuclear delivery system. See Arnett, "Conventional Arms Transfer and Nuclear Stability in South Asia," in Arnett, ed., *Nuclear Weapons*

and Arms Control in South Asia after the Test Ban (Oxford: Oxford University Press for the Stockholm International Peace Research Institute, 1998), 76–84.

11. Kanti Bajpai, "Thinking the Unthinkable," *Security, Technology and Arms Control News* vol. 2, no. 3 (February 1996): 2. See also Michael Krepon, "A Highly Damaging Scenario," *Hindustan Times* (India) (March 12, 1995).
12. Although all three countries possess nuclear-capable aircraft and the ability to deliver nuclear weapons by air, this essay does not consider aircraft for three reasons. First, nuclear-capable aircraft are not new to this region and there already exists a "library" of their movements, particularly between India and Pakistan. Both sides can predict with some degree of certainty any preparations for a strike, which is evident by the activation of forward air force bases. Attention was paid to this element during the 1986–1987 Indian "Brasstacks" exercises and the 1990 crisis that followed the "Zarb-i-Momin" exercises of Pakistan. During the Brasstacks crisis India observed that while Pakistan had concluded its air exercise, code-named "Highmark," some of the satellite airfields remained on alert. Similarly, during the 1990 crisis, one of the indicators that observers used to discount a crisis was the absence of a state of alert of forward air bases. (For discussion of the Brasstacks exercises, see Kanti Bajpai et al., *Brasstacks and Beyond: Perception and Management of Crisis in South Asia* [New Delhi: Manohar, 1995]: and Inderjit Badhwar and Dilip Bobb, "Game of Brinkmanship," *India Today* [February 15, 1987], 26. For studies of the 1990 crisis, see Hagerty, "Nuclear Deterrence in South Asia," and Michael Krepon and Mishi Faruqee eds., "Conflict Prevention and Confidence Building Measures in South Asia: The 1990 Crisis," chapter 8 of this book.) Second, even aircraft in hardened shelters are vulnerable and can be destroyed in a preventive or preemptive attack. This is not the case with missiles, which can be mobilized and fired from unprepared sites, making them harder to detect and destroy. Third, aircraft are relatively easy to detect, thereby facilitating interception. There is no assurance that a nuclear weapon delivered by aircraft will actually reach the target. In contrast, even if missiles are detected, they are almost impossible to intercept given their high speeds, short flight times, and low radar cross-sections.
13. For details of the Kargil conflict see Waheguru Pal Singh Sidhu, "In the Shadow of Kargil: Keeping Peace in Nuclear South Asia," *International Peacekeeping* Special Issue in Adekeye Adebajo and Chandra Sriram eds., "Managing Armed Conflict in the 21st Century" vol. 7, no. 4 (Winter 2000).
14. Raj Chengappa, *Weapons of Peace* (New Delhi: Harper Collins, 2000), 437. This, however, has been denied by Indian officials.
15. Bruce Riedel, "American Diplomacy and the 1999 Kargil Summit at Blair House," Policy Paper Series 2002 (Philadelphia: Center for the Advanced Study of India, University of Pennsylvania, 2002). Riedel's paper indicated that, perhaps, Prime Minister Nawaz Sharif was unaware that the military had armed the nuclear-capable missiles.
16. Before Kargil, Indian and Pakistani officials also echoed this assertion. See Dilip Lahiri, "Formalizing Restraint: The Case of South Asia" in James Brown ed., *Entering the New Millennium: Dilemmas in Arms Control* (Albuquerque: Sandia National Laboratories, 1999), 105. See also the remarks made by Director General (South Asia), Zamir Akram, a senior Pakistani diplomat at a conference on *Trust- and Confidence-Building Measures in South Asia*, organized by the United Nations Institute for Disarmament Research at Palais des Nations, Geneva, November 23–24, 1998.

17. Inaugural address by Raksha Mantri [George Fernandes], at National Seminar on *The Challenges of Limited War: Parameters and Options*, organized by the Institute for Defence Studies and Analyses (IDSA), New Delhi, January 5–6, 2000. This concept has also been emphasized in the draft Indian nuclear doctrine, which insists, "effective conventional military capabilities shall be maintained to raise the threshold of outbreak both of conventional military conflict as well as that of threat or use of nuclear weapons." See "Draft Report of the National Security Advisory Board on Indian Nuclear Doctrine," paragraph 3.2 at http://www.meadev.gov.in/govt/indnucld.htm.
18. T. Jayaraman, "Nuclear Crisis in South Asia," *Frontline* (India) (June 21, 2002). The Pakistani perspective has also been affirmed in "Nuclear Safety, Nuclear Stability and Nuclear Strategy in Pakistan: A Concise Report of a Visit by Landau Network—Centro Volta," January 2002 available at http://lxmi.mi.infn.it/~landnet/Doc/pakistan.pdf.
19. Jayaraman, "Nuclear Crisis in South Asia."
20. Jayaraman, "Nuclear Crisis in South Asia" and "N-Deterrent Gave India Second Thoughts: Musharraf," *Times of India* (June 18, 2002). Both sides were also reported to have put their nuclear weapons and related delivery systems on high alert.
21. For instance, while there is little possibility of a conventional war, let alone a nuclear war, breaking out between India and China, such a possibility cannot be entirely ruled out if there is a nuclear exchange between India and Pakistan. For instance, if India were to absorb a first strike from Islamabad and launch a second strike against Pakistan, could New Delhi be absolutely certain that it would not be struck by Pakistan's closest ally, China? Especially when India would have used most if not all of its second strike force? Also, would China be relieved of its no-first-use pledge once India had used nuclear weapons?
22. For instance, would Washington be willing to stand by and allow Islamabad to launch a nuclear strike against India knowing that India would then be compelled to respond and also might attack American troops based in Pakistan? Or would the U.S. presence guarantee that Pakistan would not use its nuclear capability, thus providing India with the assurance that even if it launched a conventional attack Pakistan would not be able to retaliate with its nuclear capability? Perhaps that is why even Indian Foreign Minister Jaswant Singh welcomed the continued U.S. presence in Pakistan. Alternatively, would the U.S. presence in Pakistan embolden the military leadership in Islamabad to use its nuclear capability with the assurance that India would not dare launch a retaliatory attack for fear of striking U.S. troops and thereby entering into an advertent nuclear conflict with the world's sole superpower?
23. See Project Director, Prithvi, Defence Research and Development Laboratory (DRDL), "Surface to Surface Missile Comes of Age in India," *Artillery Journal* (1990), 54–55.
24. See Waheguru Pal Singh Sidhu, "India Sees Safety in Nuclear Triad and Second Strike Potential," *Jane's Intelligence Review* vol. 10, no. 7 (July 1998): 23.
25. A series of stories published in the *Washington Post* claimed that the Indian Prithvi missiles had been moved to storage locations near the city of Jullandhar in the Punjab, causing concern in Pakistan. R. Jeffrey Smith, "India Moves Missiles Near Pakistani Border," *Washington Post* (June 3, 1997); and R. Jeffrey Smith, "Pakistan Warns India on Missiles," *Washington Post* (June 4, 1997). India admitted that the missiles had been moved, but not deployed. See

R. Jeffrey Smith, "India Denies It Has Deployed Missiles; Gujral Condemns U.S. Report of Arms Shift to Pakistani Border," *Washington Post* (June 12, 1997).

26. First Lieutenant Jerrold F. Elkin and Captain Brian Fredricks, "Military Implications of India's Space Program," *Air University Review* (May–June 1983), 56.
27. Suman Dubey and Amarnath Menon, "Soaring Into the Space Age," *India Today* (August 15, 1980), 70.
28. Tushar Bhatt and S. Srinivasan, "Trail-Blazing with *Agni*," the *Telegraph* (India) (May 28, 1989); Air Commodore Jasjit Singh, "India's Missile Message," the *Sunday Observer* (India) (May 28, 1989); and Dilip Bobb with Amarnath Menon, "Chariots of Fire," *India Today* (June 15, 1989), 28–32.
29. R. Ramchandran, "Cooling With a Cured Cloth," *Economic Times* (India) (January 8, 1994).
30. *Ministry of Defense Annual Report 1996–97* (New Delhi: Government of India, 1997), 55.
31. For the role of domestic politics in India's nuclear decision making, see George Perkovich, *India's Nuclear Bomb* (Berkeley: University of California Press, 1999); Peter Lavoy, "Learning to Live with the Bomb: India and Nuclear Weapons 1947–74" (Ph.D. dissertation, University of California at Berkeley, 1997); W.P.S. Sidhu, "The Development of an Indian Nuclear Doctrine Since 1980" (Ph.D. dissertation, University of Cambridge, 1997); Scott Sagan, "Why Do States Build Nuclear Weapons? Three Models in Search of a Bomb," *International Security* vol. 18, no. 3 (Winter 1996–1997): 54–86, and "The Causes of Nuclear Proliferation," *Current History* vol. 96, no. 109 (April 1997): 153–54; Shyam Bhatia, *India's Nuclear Bomb* (Ghaziabad: Vikas Publications, 1979); and Ashok Kapur, *India's Nuclear Option: Atomic Diplomacy and Decision Making* (New York: Praeger Publishers, 1976).
32. U.S. officials also endorsed this evaluation. See "Nuclear Proliferation in South Asia: Containing the Threat," Staff Report to the United States Senate Committee on Foreign Relations (Washington, DC: U.S. Government Printing Office, 1988), 2.
33. *Times of India*, July 22, 1989.
34. Personal interview with senior missile scientists involved in the second Agni test, February 1997.
35. Peter Lavoy, "Nuclear Arms Control in South Asia," in Jeffrey A. Larsen and Gregory J. Rattray eds., *Arms Control Towards the 21st Century* (Boulder, CO: Lynne Rienner Publishers, 1996), 280.
36. For details see W.P.S. Sidhu, "India and the CTBT," in Michael Clarke ed., *Brassey's Defense Yearbook 1997* (London: Brassey's, 1997), 310–24.
37. See Maseeh Rahman, "India launches cult figure 'Missile Man' as its new president," the *Independent* (July 18, 2002) and Edna Fernandes, "Missile Scientist to be India's New President," *Financial Times* (July 18, 2002).
38. See R.G. Matthews, "The Development of India's Defense-Industrial Base," *The Journal of Strategic Studies* no. 4 (December 1987): 422. For a more comprehensive understanding of the development of defense R&D in India as well as decision making related to this area, see also Thomas Graham, "India," in James Everett Katz ed., *Arms Production in Developing Countries: An Analysis of Decision Making* (Lexington, MA: Lexington Books, 1984); Amit Gupta, "Building an Arsenal: The Indian Experience," in Norman Graham ed., *Seeking*

Security and Development: The Impact of Military Spending and Arms Transfers (Boulder, CO: Lynne Rienner, 1994); P.V.R. Rao, *Defence Without Drift* (Bombay: Popular Prakashan, 1970); and K. Subrahmanyam, *Perspectives in Defense Planning* (New Delhi: Abhinav Publications, 1972). See also Itty Abraham, "Reproducing Defense: Reinterpreting Civil-Military Relations in India," Arms Control, Disarmament and International Security (ACDIS) Occasional Paper (Urbana-Champaign, IL: Program in Arms Control, Disarmament, and International Security, March 1992); and "India's 'Strategic Enclave': Civilian Scientists and Military Technologies," *Armed Forces and Society* vol. 18, no. 2 (Winter 1992): 231–52.

39. For an update, see Rahul Roy-Chaudhury, "Defense Research and Development in India," *Asian Strategic Review 1994–95* (New Delhi: Institute for Defense Studies and Analyses (IDSA), September 1995), 223–55.
40. The space program in India was formally organized only in 1962 with the establishment of the Indian National Committee for Space Research (INCOSPAR) under the Department of Atomic Energy (DAE). INCOSPAR was reformed as the Indian Space Research Organization (ISRO) only in 1969. See Timothy McCarthy, "India: The Emerging Missile Power," *Defense Journal* no. 9–10 (1993): 61.
41. McCarthy, "India," 61.
42. A declassified U.S. Department of State incoming telegram notes: "And though organizations are competitive, it is most natural for scientists and engineers working on similar problems (particularly if working for the same employer-of-last-resort) to discuss problems and successes, sharing information about their projects." U.S. State Department telegraph #31294, December 1987 (Washington, DC: National Security Archives), para. 96. This cooperation was best exemplified by Dr. A.P.J. Kalam, who began his career in DRDO, was seconded to SRO to head the SLV-3 program, and then moved from ISRO back to DRDO to lead the IGMDP.
43. Official brochure of the Missile Technology Center, comprising the DRDL and the newly constructed Research Center, Imarat (RCO).
44. Jairam Ramesh, "India's Defense Research: Need For Sustained Research," *Times of India* (September 30, 1982).
45. See Duncan Lennox ed., *Jane's Weapons System 1988–89* (Jane's Information Group, Inc., Coulsdon, UK, 1989), 122.
46. "Fire in the Sky," the *Hindu* (India) (January 19, 2001).
47. Dinesh Kumar and Manoj Joshi, "Agni-II Adds Fuel to India's N-Arms Policy," *Times of India* (January 18, 2001). See also "AGNI-II IRBM" at www.bharat-rakshak.com/MISSILES/Agni.html.
48. T.S. Subramanian, "The Significance of Agni-I," *Frontline* (India) (February 15, 2002).
49. One of the most comprehensive semi-official accounts of the missile program available in open literature is Indranil Banerjie, "The Integrated Guided Missile Development Program," *Indian Defense Review* (July 1990), 99–109. For the two strategic missiles, see Major General V.J. Sundaram (Project Director, Prithvi DRDL), "Surface to Surface Missiles Come of Age in India," *Artillery Journal* (1990), 53–55, and R.N. Agarwal, "Agni," *Artillery Journal* (1990), 56–57.
50. Andrew Koch and W.P.S. Sidhu, "Subcontinental Missiles," *The Bulletin of the Atomic Scientists* vol. 54, no. 4 (July/August 1988): 45–46.

51. See http://www.bharat-rakshak.com/LAND-FORCES/Army/Arjun.html for details.
52. See Air Marshal M.S.D. Wollen (Retd.), "The Light Combat Aircraft Story" at http://www.bharat-rakshak.com/MONITOR/ISSUE3-5/wollen.html.
53. For a hint of this reassessment in all the three services see "India's Defense Policy and Doctrine for 1980s," the keynote address by Chief of Air Staff, Air Chief Marshal Dilbagh Singh at the Second Annual Session of the National Congress for Defense Studies, Poona University (June 7, 1982). The speech was reprinted in the *Poona University Bulletin* (July 15, 1982). Also, see Commander K.R. Menon, "The Pre-Emptive Naval Strike in Limited Wars," *United Services Institute (USI) Journal* vol. 53, no. 452 (January–March 1978): 46–54; and Lieutenant Colonel J.K. Dutt, "Deep Thrust," *USI Journal* vol. 53, no. 452 (January–March 1978): 69–74.
54. Stephen P. Cohen, "The Military and Indian Democracy," in Atul Kohli ed., *India's Democracy: An Analysis of Changing State-Society Relations* (Princeton, NJ: Princeton University Press, 1988), 111–12.
55. Even as early as 1966, military strategists had pondered over the possibility of having to face a nuclear Pakistan, in addition to nuclear China. See, for instance, Major General D. Som Dutt, "India and the Bomb," Adelphi Paper 30 (London: International Institute for Strategic Studies, 1966), 1.
56. The earliest military writing about nuclear weapons appears in the late 1960s when the tempo for the Indian PNE was building up in the form of a public debate. See Eric A. Vas, "The Bomb," *USI Journal* (October–December 1967), 309–20, and "A Nuclear Policy for India," *USI Journal* (January–March 1969), 27. Subsequently, there has been a spurt of literature on the subject in the 1980s. Prominent among them are Lieutenant General Krishnaswami Sundarji, ed., "Effects of Nuclear Asymmetry On Conventional Deterrence," *Combat Papers* no. 1 (May 1981), and "Nuclear Weapons in Third World Context," *Combat Papers* no. 2 (August 1981), both compilations of a seminar conducted by the then Commandant of the College of Combat, Mhow, General Sundarji. One of the most comprehensive studies on the shape and size and strategy of a possible Indian nuclear arsenal is Brigadier Vijai K. Nair's *Nuclear India* (New Delhi: Lancer's International, 1992).
57. See "Draft Report of the National Security Advisory Board on Indian Nuclear Doctrine" at http://www.meadev.gov.in/govt/indnucld.htm and W.P.S. Sidhu, "Advantage Moderates," the *Hindu* (India) (September 11, 1999).
58. In his introduction to "Effects of Nuclear Asymmetry On Conventional Deterrence," General Sundarji noted "[t]here were only three contributors (out of about 50) who felt that nuclear weapon asymmetry would not degrade conventional deterrence to the extent that producing a nuclear deterrent was called for." Sundarji, "Effects of Nuclear Asymmetry On Conventional Deterrence," 2.
59. See Wing Commander J.P. Joshi, "Employment of *Prithvi* Missiles," *USI Journal* vol. 76, no. 526 (October–December 1996): 463–70; Major General V.K. Madhok, "An Introduction to Tactical Guided Missiles: The New Swords of War," *USI Journal* vol. 66, no. 486 (September–December 1986): 330–35. See also Lieutenant General Satnam Singh, "The Shadow of the Hill," *Artillery Journal* (1986), 1–4, and Colonel Pushpinder Singh, "Shaping the Battlefield with Artillery," *Artillery Journal* (1986), 5–11.
60. Air Commodore Jasjit Singh, "Air Strategy and Force Levels Required for the Nineties," *Trishul* vol. 2 (January 1990): 79.

61. Personal interview with Air Commodore Jasjit Singh (Retd.), New Delhi (January 1995), and personal interview with Air Chief Marshal S.K. Mehra (Retd.), Gurgaon (January 1995). According to Air Chief Marshal Mehra,

> I was one of the architects of suggesting that we should have a strategic air command. In fact, we thought of renaming the Central Air Command as the Strategic Air Command or Aerospace Command.... You had the IL–76s with you, which is a strategic airlift airplane,... then you have strategic reconnaissance aircraft (MiG 25s),... you have all these missiles being developed,... Prithvi and Agni. And all these forces were concentrated in the Central sector because these forces would never operate from the forward airfields... and this command would develop strategies, doctrine and procedures.... We had written some papers but somehow it never took off.

62. Singh, "India's Defense Policy and Doctrine for 1980s."
63. A senior air force officer disclosed that the Air Staff Requirement (ASR) for the Prithvi was made in late 1980s to fit the Prithvi. Interview with the author (January 1995).
64. See for instance, Air Vice Marshal C.V. Gole, "The *Prithvi*—Facts and Fancies," *Vayu* vol. 4 (1994): 23–30. He calculates the cost of delivering a one-ton bomb load over a distance of 250 kilometers and concludes that the cost when using aircraft would be Rs. 8.25 million, while the cost of using the Prithvi would work out to Rs. 16 million, nearly twice the cost of an aircraft-based attack.
65. See Karp, "The Maturation of Ballistic Missile Proliferation," 7–9.
66. See U.S. Army, Redstone Arsenal, "Army TACMS," Internet at http://www.redstone. army.mil/history/systems/ARMYTACMS.html for a history of the ATACMs program.
67. Sundaram, "Surface to Surface Missile," 55.
68. Joshi, "Employment of *Prithvi* Missiles," 465.
69. Karp, "The Maturation of Ballistic Missile Proliferation," 11.
70. Jasjit Singh, "Arms Control and the Proliferation of High-Technology Weapons in South Asia and the Middle East: A View from India," in Shelley A. Stahl and Geoffrey Kemp eds., *Arms Control and Weapons Proliferation in the Middle East and South Asia* (New York: St. Martin's Press, 1992), 133.
71. Shekhar Gupta, "Nuclear Weapons in the Subcontinent," in "Defense and Insecurity in Southern Asia: The Conventional and Nuclear Dimensions," Occasional Paper no. 21 (Washington, DC: The Henry L. Stimson Center, May 1995), 45–46. Gupta argues that the Pakistanis were the first to deploy the Sidewinder air-to-air missiles (AAMs), which came with the F-104s, along with the first anti-tank missiles and air-to-surface precision-guided munitions.
72. According to General Beg,

> It (the *Prithvi*) is in response to what we have on our side. We have Hatf, which is a similar program, which we deployed some about three years back. And at that time they had nothing on the ground. So, they have deployed in response to that. We don't blame them. And I don't think their *Prithvi* can carry a nuclear warhead, neither can our Hatf. I think it is just to maintain the balance. Interview with General Mirza Aslam Beg by Michael Krepon, Rawalpindi (May 1994).

73. Benazir Bhutto's statement reported in *The Muslim* (Pakistan) (February 6, 1989).

74. *Ministry of Defence 1997–98* (New Delhi: Government of India), 2.
75. John F. Burns, "India's New Defense Chief Sees Military Threat," *New York Times* (May 5, 1998).
76. For a broad overview of the genesis and evolution of the Indian threat perception vis-à-vis China see W.P.S. Sidhu, "Enhancing Indo–U.S. Strategic Cooperation," Adelphi Paper 313 (Oxford: Oxford University Press for The International Institute for Strategic Studies, 1997), 15–18.
77. John Ackerly, *Nuclear Tibet* (Washington, DC: International Campaign for Tibet, June 1993).
78. Cited in *New York Times* (September 29, 1974).
79. R.R. Subramanian, "Missile Equation in South Asia," *The Pioneer* (India) (October 1, 1997).
80. See British Broadcasting Corporation (BBC), Summary of World Broadcasts (SWB), SU/6024/A3/4 (January 24, 1979); BBC/SWB/ FE/6343/BII/14 (February 12, 1980), citing *Kyodo* (Japanese News Agency); BBC/SWB/ SU/6346/A3/4 (February 15, 1980), citing Hong Kong and Japanese media reports; BBC/SWB /SU/6373/A3/4 (March 18, 1980), monitoring "Radio Peace and Progress;" BBC/SWB/SU/6735/A3/5 (May 29, 1981), citing TASS; BBC/SWB/SU/7059/A3/1 (June 23, 1982); BBC/SWB/SU/7091/ A3/1 (July 30, 1982). See also Tinley Nyandak, "Tibet for the Tibetans, Not China's Arms," *New York Times* (September 18, 1982), which refers to a report in the Hong Kong newspaper *Shih Bao*, and "Chinese Deployment of Nuclear Missiles in Tibet," *International Defense Review (IDR)* (November 1, 1987), 1454.
81. See Government of Tibet in Exile (London), "Militarisation and Regional Peace," Internet at http://www.tibet.com/WhitePaper/white10.html.
82. International Institute for Strategic Studies (IISS), *The Military Balance 1988–89* (London: Brassey's for the IISS, 1989), 149.
83. Robert S. Norris, Andrew S. Burrows and Richard W. Fieldhouse, *Nuclear Weapons Databook Volume V: British, French and Chinese Nuclear Weapons* (Boulder, CO: Westview Press, 1994), 338–41, fig. 6.10, 346–47.
84. Ramesh Chandran, "New Chinese Missiles Target India: US Daily," *Times of India* (July 11, 1997).
85. See BBC/SWB/FE/8627/I (July 23, 1987).
86. Achin Vinaik, "Mystery of the Reorient," *The Telegraph* (India) (March 31, 1997).
87. Ibid.
88. National Resources Defense Council (NRDC), NRDC Nuclear Program Nuclear Data, "Table of Chinese Nuclear Forces, end 1996," Internet: http://www.nrdc.org/nrdcpro/nudb/datab17.html.
89. Simon Henderson, "Pakistan's Atomic Bomb," *Foreign Report* (January 12, 1989); David Albright and Mark Hibbs, "Pakistan's Bomb: Out of the Closet," *Bulletin of Atomic Scientists* vol. 48, no. 4 (July–August 1992): 38–43; Bill Gertz, "Pakistan-China Deal for Missiles Exposed," *Washington Times* (September 7, 1994); R. Jeffrey Smith and Thomas W. Lippman, "Pakistan M-11 Funding is Reported," *Washington Post* (September 8, 1994); Michael Klare, *Rouge States and Nuclear Outlaws* (New York: Hill and Wang, 1995), 152, 191.
90. James Woolsey's testimony before the Senate Governmental Affairs Committee (February 24, 1993).
91. R. Jeffrey Smith and David B. Ottaway, "Spy Photo Suggest China Missile Trade," *Washington Post* (July 3, 1995); R. Jeffrey Smith, "China Linked to

Pakistani Missile Plant," *Washington Post* (August 23, 1996); and Douglas Waller, "The Secret Missile Deal," *Time* (June 30, 1997), 58.

92. Ministry of Defence, *Annual Report 1996–97* (New Delhi: Government of India), 2.
93. "Fernandes Sees No Threat from Ghauri," the *Hindu* (India) (April 10, 1998).
94. Sishir Gupta, "Govt. Decides to Develop Missile System," *Hindustan Times* (India) (May 5, 1998); "Go-ahead for *Agni* Second Phase?" the *Hindu* (India) (May 4, 1998); and "Govt. Okays Agni's Upgradation," *Indian Express* (May 4, 1998).
95. See Article III of the "Agreement between the Government of the Republic of India and the Government of The People's Republic of China on Confidence-Building Measures in the Military Field Along the Line of Actual Control in the India–China Border Areas" in Michael Krepon, Khurshid Khoja, Michael Newbill and Jenny S. Drezin eds., *Global Confidence Building* (New York: St. Martin's Press, 1999). See also remarks made by Dr. Li Bin, Director, Arms Control Research Division, Institute of Applied Physics and Computational Mathematics, Beijing (speech at the Defense Special Weapons Agency International Conference on Controlling Arms, Philadelphia, PA., June 11, 1998). He has supported a Sino-Indian ban on short-range nuclear-capable missiles along their border.
96. "Missiles Will Carry Nuclear Warheads, Says George," *Indian Express* (May 27, 1998), and "Indian Nuclear Weapons Are Inevitable—Minister," *Reuters* (May 26, 1998).
97. "Indian Nuclear Weapons Are Inevitable."
98. These arguments are adapted from Lavoy, "Nuclear Arms Control in South Asia," in Jeffrey A Larsen and Gregory J. Rattray eds., *Arms Control toward the 21st Century* (Boulder, Colorado: Lynne Rienner, 1996), 273–74. Lavoy developed these in the context of nuclear weapons; they are equally applicable to nuclear-capable missiles.
99. "Make Nehruvian Dream a Reality," the *Hindu* (India) (August 14, 1998).
100. One indication of this is India's attempts to procure the SA-300 system from Russia as well as acquire the Arrow technology from Israel. See David Ruppe, "India: Washington Considers Allowing Transfer of Arrow Interceptor," *Global Security Newswire* (June 30, 2002). In the long run India may also try and develop its own missile defense system based on the Akash SAM system and other space-based assets. See Group Captain R.G. Burli, "India's Option for Space-Based BMD," *Indian Air Force 2000*, 40–42.
101. For a detailed discussion on the impact of missile defense on strategic stability between India, Pakistan, and China, see Waheguru Pal Singh Sidhu, "The Implications for Postures and Capabilities in South Asia," Center for Nonproliferation Studies (Monterey) and the Mountbatten Centre for International Studies (Southampton), *Special Joint Series on Missile Issues*, Occasional Paper No. 7, International Perspectives on Missile Proliferation and Defenses (May 2001).
102. Gregory Koblentz, "Theater Missile Defense and South Asia: A Volatile Mix," *The Nonproliferation Review* (Spring–Summer 1997), 59–60. Air Commodore Jasjit Singh has also endorsed this view in an interview with the author (January 1995).
103. Raj Chengappa, "Worrying over Broken Arrows," *India Today* (July 14, 1998), Internet: http://www.india-today.com/itoday/13071998/defence.html.
104. Vishal Thapar, "India's Nuclear Command to Be in Place by June," *Hindustan Times* (India) (April 24, 2002).

105. There are three variants of the *Prithvi*: the SS-150 with a range of 150 km for the army; the SS-250 with a 250 km range for the air force; and an SS-350 that is still in development. See Raj Chengappa, "Boosting the Arsenal," *India Today* (February 29, 1996), 98–99.
106. For details, see Gerardi, "India's 333rd *Prithvi* Missile Group," 361–64, Mannshaiya, "India's *Prithvi*," 23–25, and Chengappa, "Boosting the Arsenal."
107. As noted earlier an attempt in this direction appears to have been made in Article III of the 1996 Agreement between the Government of the Republic of India and the Government of The People's Republic of China on "Confidence-Building Measures in the Military Field Along the Line of Actual Control in the India–China Border Areas." Similarly, India and Pakistan also appear to have moved in this direction as part of the Lahore Declaration, which provides for prior notification of missile tests. See http://www.meadev.gov.in/lahore.htm.
108. Krepon and Faruqee eds., "Conflict Prevention," chapter 8 in this book.
109. Bajpai et al., *Brasstacks and Beyond*, 34–35.
110. Smith, "India Denies It Has Deployed Missiles."
111. For details see http://www.meadev.gov.in/lahore.htm.
112. See http://asia.cnn.com/SPECIALS/2001/agra.summit/.
113. See, for instance, "Despite Historic Agra Summit, India-Pakistan Relations Remain in Dead," *People's Daily* (China) (December 16, 2001), Internet: http://english.peopledaily.com.cn/200112/16/eng20011216_86809.shtml; "Pakistan Press: India Ruins Agra Summit," *People's Daily* (China) (July 17, 2001), Internet: http://english. peopledaily.com.cn/200107/17/eng20010717_75180.html; "Indo–Pakistan Summit Collapses: Indian Media Reports," *People's Daily* (China) (July 27, 2001), Internet: http://english.peopledaily.com.cn/200107/17/eng20010717_75141.html; Ajai Shukla, "Battle Against History," *Indian Express* (July 18, 2001), Internet: http://www. expressindia.com/summit/an20010718.html; "The Right Approach," *Dawn* (Pakistan) (July 20, 2001), Internet: http://www.dawn.com/2001/07/20/ ed.htm.
114. Hasan Akhtar, "Islamabad, Delhi Exchange Lists on N-facilities," *Dawn* (Pakistan) (January 2, 2002), Internet: http://www.dawn.com/2002/01/02/top1.htm.

5

Missile Threat Reduction and Monitoring

Kent L. Biringer

Missile-based threats are becoming an ever increasing element of the strategic landscape in South Asia.[1] As India and Pakistan induct missiles into military units and push the performance envelope of missile capabilities, it is important to assess ways to limit the threats posed by these missiles. Regional stability with respect to missiles has both political and technical components. From a deterrence standpoint, striving to maintain some parity in capabilities could be a politically stabilizing factor in reducing the likelihood of conflict. Introduction of missiles might serve to correct imbalances in nuclear or conventional capabilities. On the other hand, as the inventories and types of missiles increase and as they are deployed, there could be an escalation of tension. These actions will result in more movement of systems, a rush to deploy new systems, the need for more testing, greater numbers of people with access to the systems, and the need for more distributed control. These and other factors raise concerns over system safety, security, and interpretation of intent. Together these developments serve to introduce instabilities that may outweigh the deterrence benefits.

Missiles are of primary concern because of their potential use as delivery vehicles for nuclear weapons. The short flight times and lack of recall ability make them more destabilizing than aircraft-delivered weapons. Many of the military advantages of missile systems, such as mobility, speed, and long range make them weapons of choice. Transparency for missile programs may offer the prospect of building confidence and reducing threats. However, tradeoffs exist between providing transparency and risking vulnerability. These tradeoffs will be fundamental to missile discussions and agreements for years to come. Ultimately it must be decided that it is in the best national security interests of both countries to provide sufficient transparency, with its inherent risks, to avoid the even greater risks associated with misinterpretation, accident, or unauthorized use of missile systems.

This essay explores the concepts of missile control, especially missile nondeployment. It focuses especially on the role that monitoring technology

and procedures could play in verifying controls or limits placed on the quantities, capabilities, or deployment of missile systems. With a history of conventional military conflict, and the demonstrated and declared nuclear weapon capabilities of India and Pakistan, it is vital that stability be maintained in the region.

CONTEXT

India and Pakistan have never resolved their differences since both nations became independent in 1947. They have fought three major wars. The first was at the dawn of their independence. Other wars took place in 1965 and 1971. By many assessments, the 1999 conflict in Kashmir near Kargil can also be deemed to have been a war due to the intensity and large number of casualties. In addition, there is a long history of low-intensity conflict in Kashmir. Kashmir remains divided along a Line of Control that has existed with only minor changes since a ceasefire that ended the first major war. Diplomatic relations have been largely problematic with current formal interactions nearly nonexistent. Even official commerce and trade between the two countries, which have tremendous potential, are very limited.

These factors are superimposed on a very dynamic political environment in which there have been frequent changes in leadership due to unstable domestic political alliances, assassinations, and in the case of Pakistan, military takeovers. The situation became even more tenuous in May 1998 when both nations exploded a series of nuclear weapons in underground tests to scientifically evaluate and politically demonstrate their capabilities as nuclear weapons states. These tests occurred outside the bounds of the Nuclear Nonproliferation Treaty to which neither India nor Pakistan is a signatory.

Against this backdrop, for nearly two decades, the two nations have been developing and expanding their ballistic missile capabilities. These weapon delivery systems pose a risk of heightened tensions, inadvertent or accidental launch, and the prospect of use in a regional nuclear war.

Missile Developments

In 1983, India began a comprehensive missile development program known as the Integrated Guided Missile Development Programme (IGMDP) managed by the Defense Research and Development Organization (DRDO).[2] This program has had the aim of achieving self-sufficiency in missile production and development. It envisioned: an intermediate-range (2,500 km) missile; a battlefield-support (150 km) missile; quick-reaction, surface-to-air missiles; and an anti-tank missile.[3] Of primary interest to this essay are the developments of the battlefield-support and intermediate-range missiles.

Several Indian missile systems are named after the elements: Prithvi (earth), Agni (fire), Akash (sky), and Sagarika (ocean). In addition, the anti-tank missile Nag (snake) and surface-to-air Trishul (trident) carry Hindu significance.

The Prithvi is a single-stage, road-mobile, liquid-fueled battlefield missile. This short-range ballistic missile (SRBM) was first test-fired in 1988 and on June 16, 2000 India completed its seventeenth test firing of the Prithvi.[4] Several variants of the missile have been developed. The 150 km range army version is in service. A longer-range (250 km) air force version has also been developed and was flight-tested in December 2001.[5] Under development is a variant of the Prithvi that will be used for naval purposes. This third variant, also known as Dhanush, was test-fired unsuccessfully in April 2000 and successfully in September 2001.[6] Debate exists on the viability of this system and its utility as an anti-ship weapon versus a shore bombardment system.[7] Published reports in September 2000 indicated an Indian government decision to proceed with production of 300 Prithvi missiles.[8] The missiles were to be produced at the state-owned Bharat Dynamics Limited in Hyderabad. The Army was to receive 150 missiles, the Navy 100 missiles, and the Air Force 50 missiles. The Indian government later denied these reports.[9]

The Agni is a two-stage, intermediate-range ballistic missile (IRBM). The Agni missiles are designed to extend the reach of Indian nuclear capabilities, particularly to China. The Agni-I technology demonstrator was first test-fired in May 1989. It had a nominal range of 1,500 km. Its two-stage design consists of a solid-fueled, first-stage motor based on the first stage of the satellite launch vehicle SLV-3 and a liquid-fueled second stage based on the Prithvi SRBM.[10] Two subsequent flight-tests were conducted in May 1992 and February 1994. A new short-range version of the Agni-I with a range of 700 km was flight-tested in January 2002.[11] In August 2000, news reports indicated that India had ten Agni missiles and two prototypes of the Agni-II.[12] The Agni-II was first tested in April 1999. The two-stage Agni-II "is a completely solid-fuel missile. . . . [T]he second stage (roughly $3\,m \times 1\,m$) solid motor has been designed anew specifically for the missile."[13] The reported range for the Agni-II varies from 2,000 to 2,500 km. The most recent Agni-II test in January 2001 reportedly struck its target at a distance of 2,200 km.[14] In February 2001, Defence Minister George Fernandes said, "Agni II, which is capable of carrying nuclear weapons, is ready for induction into the defence arsenal."[15] The possibility of an even longer-range Agni-III, capable of reaching all of the population centers in China, has also been discussed.

Pakistan also has had an active missile acquisition and development program since the early 1980s. This includes indigenous missile development (based in part on foreign designs) as well as the reported purchase of 300 km range M-11 missiles from China in the early 1990s, reports denied by Pakistan and China.[16] Both SRBMs and IRBMs exist or are in development. Within Pakistan are competing organizational interests in missile development as with nuclear weapon development. The Pakistan Atomic Energy Commission (PAEC), the Khan Research Laboratories, and the Space and Upper Atmosphere Research Commission (SUPARCO) all play a missile development role.

The Hatf, or armor, missiles are single-stage, solid-fueled, indigenous, battlefield-range ballistic missiles. The Hatf-1 has a range of 60 to 80 km

carrying a 500-kg payload.[17] It was first flight-tested in 1989 and a longer-range 100 km variant, Hatf-1A, was tested early in 2000.[18] It is believed to be in service in limited numbers. Although it is reported to be able to accommodate "a variety of warheads,"[19] its short range is unlikely to be used for nuclear warheads. Longer-range variants include the Hatf-2 (Abdali) missile with a nominal range of 180 km and the Hatf-3 (Ghaznavi) missile with a range of 290 km. Both of these systems were flight tested in May 2002.[20]

As mentioned above, it is believed that China supplied M-11 (300 km/500 kg payload) missiles to Pakistan in the early 1990s. Indigenous variants were also developed. The Shaheen (Eagle) missile is based on the Chinese M-11 missile design with extended range. It is designated as a Hatf-4.[21] Work began in 1995, managed by the National Defence Complex, a PAEC subsidiary. "The claimed 750 km range of the Shaheen is roughly double the standard range of the Hatf-3/M-11, and is consistent with the range of the much larger Chinese M-9."[22] This 750 km range, single-stage IRBM was tested on April 15, 1999.[23]

A more capable variant, Shaheen-II, has also been developed. Shaheen-II is a two-stage, solid-fuel missile capable of carrying a heavier warhead to a longer range of 2,000 km or more. In December 2000, chief scientist of the PAEC, Dr. Samar Mubarik Mand, "informed the authorities that Shaheen-II was ready for test firing."[24] Shaheen-II ballistic missiles were displayed during the Pakistan Day parade in Islamabad on March 23, 2000. "Pakistan has claimed that the medium-range Shaheen-I and the intermediate-range Shaheen-II ballistic missiles were not only in 'regular production' but have already been inducted into the army."[25]

A parallel IRBM effort under the direction of the Khan Research Laboratories is the Ghauri missile program. Ghauri-I is a liquid-fuel, single-stage, 1,500 km missile. The Ghauri-II is a liquid-fuel, two-stage missile with a claimed range of 1,750 km. The Ghauri-II was first flight-tested on April 6, 1998. Pakistan used the Hatf-5 label for both the Ghauri-I and -II.[26] Ghauri is believed to be derived from the North Korean Nodong missile design. The Ghauri-II was again flight-tested in April 1999. An even longer-range Ghauri-III based on the North Korean Taepo Dong was thought to have been tested in August 2000.[27] The Ghauri-III would have a range of 2,400–3,000 km. In May 2002, a Ghauri-III flight test became the third in the Ghauri series to be flown.[28]

> The Ghauri name is highly symbolic and taken from a Muslim historical figure, Sultan Muhammad (Shahubiddin) Ghauri who defeated the Hindu ruler Prithvi Raj in the last decade of the 12th century. "Prithvi" is the name India has assigned to its short-range ballistic missiles. Thus, Pakistan is attempting to manipulate public perceptions and show that it has developed a credible response to Indian missile capabilities.[29]

With increasing types, numbers, and capabilities, missile developments in both Pakistan and India are moving forward quickly and extensively.

Strategic and Tactical Concerns

The South Asia context presents its own set of unique issues and challenges when it comes to evaluating the threat and concerns associated with ballistic missiles and their proliferation. The following are some of the key parameters in the missile calculus of South Asia.

Short Time of Flight

Ballistic missiles currently represent the fastest means for delivery of weapons from one country to another. In a matter of a few minutes, a missile can cover a distance of hundreds of kilometers. For example, reports of the 1999 flight test of the Ghauri-II indicated "the missile reached the targeted distance of 1,165 km in 12 minutes."[30] The use of even shorter-range missiles makes it possible for attacks on national capitals to be carried out in less than five minutes.

Response Times

India and Pakistan, who share a nearly 3,000 km land boundary, are especially affected by the short response times associated with missile threats. Cities such as Lahore and Amritsar are only tens of kilometers from the border. Islamabad is less than 100 km from the border and even Delhi is less than 400 km from the border. Given that missile flight times themselves are only a few minutes, warning times are even less due to the time required for sensors to detect the missile already in flight. Response times are further reduced because of delays in communicating to decision makers, assessing information, making decisions, and finally giving orders on how to respond. It is likely that this process might not be completed before a threatening missile has reached its target. It also may result in a launch-on-warning posture in which countries respond prematurely before having time to fully assess the warning information received. At present, India has declared a no-first-use policy for nuclear weapons. Pakistan has not adopted such a policy due to perceived conventional military asymmetries. While there is an asymmetry in strategic depth between India and Pakistan, the fact that each country has critical assets near the border means that they both face potentially short response times in the case of missile attacks.

Accidents and Misinterpretation

Concerns over misinterpretation of missile launch data are real. During the Cold War, there were a number of incidents involving accidents and misinterpretations related to nuclear weapons and delivery systems. One example of misinterpretation of missile-related data cited by Scott Sagan was the 1979 inadvertent placement of a training tape showing a missile attack into the live warning system.[31] Six minutes were needed to assess the threat before determining it was false. While that was sufficient time in the context of longer

range US–USSR intercontinental missile threats, such time would not be available with the short flight times associated with the Indian and Pakistani missiles. Similarly, such short flight times were of concern in Europe where six minutes was the time taken by an intermediate-range missile to reach Moscow from Western Europe. A 1983 Senate investigation revealed that there were 151 false alarms in a six-month period, the longest of which was six minutes.[32] These concerns contributed to agreement on an Intermediate Range Nuclear Forces Treaty (INF). Another incident in 1980, which resulted from a failed computer chip, again led to a false indication of missile attack.

In 1995, Russian officials misinterpreted a missile launch conducted as a joint Norwegian–American research rocket study of the northern lights. Despite prior notification, Russian authorities did not get the word and used their internal hotline link to discuss a possible retaliatory strike.[33] Thus, given the small but real likelihood of false warnings, it is essential that India and Pakistan institutionalize the practice and procedures associated with adequate communication, launch notification, and anomaly resolution.

The China Factor

No discussion of the missile relationship of India and Pakistan could be complete without acknowledging China's role. China and India are rivals and have long-standing political and territorial disputes. In 1962, India fought a border war with China, losing large tracts of border land. In a letter to President Clinton following India's nuclear tests in May 1998, Indian prime minister Vajpayee wrote:

> I have been deeply concerned at the deteriorating security environment, specially the nuclear environment faced by India for some years past. We have an overt nuclear weapon state on our borders, a state which committed armed aggression against India in 1962. Although our relations with that country have improved in the last decade or so, an atmosphere of distrust persists mainly due to the unresolved border problem. To add to the distrust that country has materially helped another neighbour of ours to become a covert nuclear weapons state. At the hand of this bitter neighbour we have suffered three aggressions in the last 50 years.[34]

Unconfirmed reports of Chinese missiles poised to strike India from Tibet have also been circulating for years. India's Agni-II missile has a range of up to 2,500 km,[35] enabling it to reach critical portions of China. Despite these concerns, there are also positive, although tenuous, signs in the Sino-Indian relationship. Two border agreements were signed in the past decade.[36] High-level symbolic diplomatic visits between the two nations have increased. However, near the end of a visit by Chinese leader Li Peng to India in January 2001, India tested its latest long-range Agni missile system.

Pakistan has a strong missile connection with China. Chinese M-11 missiles were reportedly shipped to Pakistan in the early 1990s. Most other Pakistani missiles are believed to be variants of established Chinese or North

Korean missile designs. Suspected Chinese assistance with the missile and nuclear programs of Pakistan has been a great source of political tension between India and China. This issue continues to be in the news. In its semi-annual report to Congress on arms proliferation, the Central Intelligence Agency stated "Chinese missile-related assistance to Pakistan continued to be substantial during this reporting period."[37]

The future of missile defenses remains a contentious issue in China and South Asia, as elsewhere. There are currently no effective anti-missile defense systems in South Asia. This increases the importance of the potential for devastation in the event of accidental or unauthorized launch of a missile since such attacks cannot be defended against. India has had interest in missile defense and has pursued the acquisition of technologies applicable to missile defense. Decisions by the United States, South Asian countries, or others to deploy missile defenses will impact regional debate on missile proliferation and control regimes.

Missile Threat Reduction and Monitoring

While the situation in South Asia is unique in its history, geography, culture, and strategic concerns, there are some lessons to be learned from experiences in other parts of the world, including the U.S.–Soviet relationship during the Cold War. The analysis presented here is intended to illustrate what is possible rather than prescribe what should be done.

This essay introduces a framework for evaluating ways to reduce and monitor the threats posed by ballistic missiles in South Asia. In the following sections a number of concepts are outlined for achieving these objectives. The effectiveness of each concept would depend on a complicated mix of political, technical, and operational factors. The goal is to achieve greater stability while reducing threats. There is a role for both transparency and opacity in missile threat reduction. Transparency is needed for information to be shared as a result of treaties or less formal agreements. Such information may include everything from force levels to testing plans.

While most of the emphasis here is on transparency and ways of sharing information to increase stability, sometimes, choosing not to share information could serve to enhance stability. Information that figures heavily into a country's deterrent strategy is not likely to be revealed. This includes items as diverse as system deployment locations, system vulnerabilities, and performance capabilities.

For any choice of action or piece of information related to South Asian missile programs, a matrix of data sharing and stability impacts needs to be assessed. When choosing actions or deciding on sharing information, choices should be based on stabilizing effects. In each case a decision needs to be made on whether being transparent or opaque would enhance stability. Generally, transparency would lead to greater stability when the following

criteria are achieved as a result of providing information:

- Increased symmetry of forces and/or capabilities.
- Increased warning time or reduced likelihood of preemption success.
- Reduced likelihood of misinterpretation of intent.
- Minimized vulnerabilities for either side.

Figure 5.1 shows examples of actions or information that fit the different quadrants of a stability matrix. The destabilizing examples emphasize asymmetries in capabilities and failure to reveal important information that could lead to misinterpretation. The stabilizing examples reveal actions intended to avoid misinterpretation and to minimize vulnerabilities to critical assets.

Actions and declarations could be unilateral or reciprocal in nature. Sometimes it is in the best interest of one's own security to act unilaterally to avoid misinterpretation of intent. Likewise, in the case of asymmetrical forces, decisions to unilaterally redeploy forces or reduce force strength could help to build confidence and promote dialogue without jeopardizing national security. Bilateral actions are those that, by mutual agreement, enhance the stability of both sides as a result of the action or data sharing.

The attempt here is not to be prescriptive but to outline a series of options for utilizing transparency to reduce threats. Specific proposals, timing, and political motivation would determine the ultimate path forward on missile transparency.

Infrastructure Needs

Communication systems form a necessary backbone for threat reduction and monitoring. The process of managing missile possession in tense regions demands a reliable, secure, dedicated, and timely communications infrastructure. With the short timelines involved and the potential for misinterpretation of data or messages, it is vital that potential adversaries have a trusted means for communicating with one another. This communication

Demonstrate Expanded Missile Range and Payload Capabilities	Provide Missile Launch Notification	Transparent
(promote arms race)	(avoid misinterpretation)	
Avoid Dialogue on Missile Alert Status During Conventional Armed Conflict	Avoid Revealing Complete List of Warhead Storage Locations	Opaque
(risk misinterpretation)	(minimize vulnerabilities)	
Destabilizing	Stabilizing	

Figure 5.1 Example stability/transparency matrix

may take the form of declarations and notifications, or may consist of sensor information from a verification system.

Such communication may consist of voice messages, sensor or other data, images, or text messages. The system may take the form of a "hotline" between military or political leaders. Between India and Pakistan, a hotline does exist between Directors General Military Operations. However, a national command authority–dedicated hotline has not been a permanent feature of India–Pakistan relations. Such communications appear necessary to deal with time-critical issues of interpretation of missile-related information. Indian and Pakistani leaders acknowledged the importance of communication in a 1999 Memorandum of Understanding (MoU). In the memorandum, the foreign secretaries agreed that "The two sides shall undertake a review of the existing communications links (e.g., between the respective Directors General Military Operation) with a view to upgrading and improving these links, and to provide for fail-safe and secure communications."[38]

Another communication network may also be considered for transmission of routine missile-related information. The Nuclear Risk-Reduction Center (NRRC) that exists between the United States and states of the former Soviet Union is an example of such a system. The NRRC serves as a clearinghouse for treaty-related information exchanges.

Communication will be reassuring if there is trust in the validity of the information provided. Technical means could be employed to verify the authenticity of the data and messages. Use of encryption or data authentication would permit the recipient of data to know the specific source of information. Accuracy of the information, however, would be dependent on periodic independent assessments of information from other sources such as intelligence data or on-site inspections.

Declarations and Notifications

Public declarations could be stabilizing or destabilizing, as a previous Stimson Center report has noted:

> Well chosen words delivered in public declarations by national leaders can serve to reassure neighbors, demonstrate good will, reinforce common interests, open lines of communication, break deadlocks, and promote regional stability and security. Public declarations can also be used to reinforce enemy images, mobilize for war, as well as other negative pursuits.[39]

On the positive side of the equation, declarations and notifications could be useful confidence-building measures (CBMs) associated with missile development and deployment. Missile quantities, movements, test launches, and exercises may be declared in order to avoid the risks associated with misinterpretation of intent. The value of such notifications was recognized in the 1999 Lahore MoU, which stated, "The two sides undertake to provide

each other with advance notification in respect of ballistic missile flight tests, and shall conclude a bilateral agreement in this regard."[40]

Shortly after the Lahore MoU, missile tests were conducted that followed the "spirit of Lahore." For example, in April 1999, the following Indian news item appeared: "But determined to preserve the Lahore momentum, India informed Pakistan and the great powers of the impending Agni test on April 9 two days before the event."[41] Similarly, in Pakistan, reports of a Foreign Office statement on the subsequent Ghauri missile test stated, "Pakistan had given prior notification of this test to India in accordance with the Memorandum of Understanding signed in Lahore in February."[42] Despite the conflicts and animosity that have surrounded India–Pakistan relations since the time of Lahore, this provision of launch notifications continues to be implemented in the absence of a more formalized agreement. For example, in January 2001, India tested its Agni-II missile.

> The Indian government said other countries, including neighboring China and Pakistan, were given advance notice of the Agni test, which was conducted hours before China's second most powerful leader Li Peng left for home after a nine-day visit.[43]

Again, in May 2002 at a time of extreme tension between India and Pakistan, "India confirmed it had been informed by Pakistan that it planned to conduct 'routine' short and medium-range missile tests . . . "[44] In addition to providing test flight notifications, agreements to notify movement or repositioning of missile forces might also be considered. Such notification could add to confidence building and minimize misinterpretation of motives.

While declaratory measures have the potential to build confidence among parties, deliberate attempts at misinformation or disingenuous declarations could serve to undermine security and confidence. As P.R. Chari has noted,

> In the case of India and Pakistan, national leaders have occasionally made positive declarations, but to little effect. The empirical evidence suggests that confidence-building measures, including positive declaratory statements, have been difficult to initiate and sustain in the Indo–Pakistani milieu.[45]

If the media and political leaders adopt a belligerent posture, as has often been the case in times of tension, official declarations will do little to contribute to risk reduction.

Notification agreements have been and continue to be an important element of U.S.–Russia nuclear cooperation. Discussions continue between the United States and Russia to further expand the notion of communications and data sharing:

> The pre- and post-launch notification system envisages a data center opening in Moscow and builds on agreements to share early warning information signed in 1998 and June 1999 . . . The two countries agreed back in 1991

> under START I, the first in a series of Strategic Arms Reduction Treaties slashing nuclear arsenals, to tell each other about launches of intercontinental and submarine-launched ballistic missiles . . . (the recent) memorandum of understanding expanded on this to include shorter-range ballistic missiles, sounding and research rockets and most space launch vehicles.[46]

Also noteworthy is that under the agreement other countries will be invited to participate in the notification system. Specifically, considering Indian and Pakistani participation in this system could provide an initial framework for cooperation.

Non-Deployment and De-Alerting

The goals of missile non-deployment and de-alerting are to reduce the tensions and risks associated with missile systems that could be readily employed. This includes reducing the likelihood of accidental or unauthorized use and increasing the time required to make the system operational.

The status of missile development and deployment is a key issue in regional strategic stability, nonproliferation, as well as weapon system safety and security. Generally, deployed weapons systems are those that have reached a necessary level of technical maturity and reliability, have been issued to operational military units, are in place in appropriate positions, and can therefore be available on short notice to be used by those units in support of military objectives. Non-deployed and less fully deployed systems lack some or all of the above criteria.

For example, systems that lack sufficient development and reliability testing are not assigned to operational units and are not available for military use. Some systems may have been sufficiently tested but are still in the process of being deployed with operational units and could not be used militarily in a short time. In this case, more training and familiarity is needed to integrate the weapon into the war fighting capabilities of the military and to be considered deployed. Limited deployment is another variant. Deployments could be limited in terms of numbers or location. For instance, deployment with an operational military unit whose location is out of range of an enemy is a form of limited deployment.

Finally, de-alerting measures have been defined as "reversible actions taken to increase the time or effort required to launch a . . . ballistic missile."[47] These measures are designed to prevent accidents or unauthorized use, and also serve to slow the deliberate or intended use of a weapon system by requiring time to fully redeploy the system. In this case, the hardware, training, and missions are clear but operational roadblocks against use are intentionally put in place.

The degree to which missiles are deployed is primarily a political decision. Other factors such as technical development, training, and perceptions of threat may also play an important role in the timing of missile deployment.

Disassembly and Storage

One aspect of non-deployment or de-alerting is storage of the major missile components or systems. Deployment would require moving items out of storage. Storage and subsequent movement provide opportunities for monitoring. Questions exist on the degree of intrusiveness that would be permitted for such monitoring. Items placed in declared storage locations can be monitored through a combination of inspections and technical monitoring means.

Complete weapon systems could be stored fully assembled. The fact that they are stored rather than deployed in an operational sense is one level of de-alerting. One could further de-alert the missiles by removing or disassembling critical components. The fact that reassembly or reinstallation is required makes the system more inherently safe and reduces the likelihood of unauthorized use. Components that have been removed or disassembled could be colocated or stored at separate locations. Status of storage and level of assembly of these systems could then be subject to monitoring and inspection. This assumes that monitoring agreements on storage and disassembly involve the declaration of storage sites and some level of intrusiveness in permitting monitoring or inspection of those sites.

Technical monitoring of storage areas involves use of a number of sensor types to detect activity level in or around the facility. Under terms of a missile non-deployment or de-alerting agreement, such activity may be prohibited or require advance notification. Ground sensors such as seismic, magnetic, or acoustic sensors could be used to detect movement around the facility perimeter or on access roads leading to the facility. These data could be collected and stored on site and sent by radio, satellite, phone, Internet, or other communication means to agreed parties anywhere in the world. Similarly, facility monitoring sensors such as door switches, motion sensors, or electronic seals could be used to detect entry or activity in the facility. Use of sensor-triggered video systems, which capture a digital image when another sensor is activated, could be used to better characterize any detected interior or exterior event. Use of appropriate data authentication or encryption techniques could provide necessary security to the data collected and transmitted.

Facility monitoring of sensitive facilities, such as International Atomic Energy Agency (IAEA) safeguarded sites around the world, has been conducted with tags, seals, and video recording systems for many years. The tags have been used to uniquely mark controlled items. Seals have been used to indicate any tampering with containers, monitoring equipment, or portions of the facility that have been closed and sealed. Video systems have been based on periodic recording of video images in nuclear facilities of interest. In each of these cases, the technologies are a supplement to a regular program of on-site inspections. IAEA inspectors check the tags and seals, and the videotapes are removed at times of inspections and returned to Vienna for review by inspection officials.

More recent experiments between the U.S. Department of Energy and the IAEA have demonstrated the use of sensor-triggered video in a number

of countries. These systems provide more timely data and may also reduce the frequency of required inspections. Such use of technology and inspections might play a similar role in the confidence building associated with missile monitoring in South Asia. If missile agreements could be reached, there may be a need to define monitoring regimes and to conduct baseline inspections associated with initial agreement declarations. In addition, follow-up inspections on a periodic or challenge basis might also be necessary to build sufficient confidence in the notification of activities and successful operation of monitoring systems.

Another form of disassembly and de-alerting is maintaining liquid-fueled missiles in an unfueled condition. This minimizes the likelihood of accidental or unauthorized use. Before a missile could be launched, a time-consuming process of fueling must take place. The activity levels associated with the vehicles and crews necessary to do the fueling also provide an added monitoring signature. While this option exists for some South Asian missiles such as the Indian Prithvi and Pakistani Ghauri, many of the other systems are solid fueled and do not require this added step prior to launch.

Non-Deployment Areas and Missile Movements

Restricting deployment of missile systems from specific geographic locations is another control mechanism to limit threats. For shorter-range missiles, decisions to remove the missiles away from borders and out of range of the other side could build confidence and reduce the potential threat level. Much as a demilitarized zone (DMZ) is intended to provide some cushion to avoid rapid conventional military escalation, so this missile DMZ could provide a buffer against rapid escalation to the use of battlefield missiles. These actions could be taken unilaterally or cooperatively.

As an example, in 1997, it was reported that India had moved Prithvi missiles to locations near Jullundur in Punjab adjacent to the border with Pakistan.[48] However, the subsequent warnings and political impacts, both in the region and internationally, caused India to reconsider. "India has shown subsequent good sense by physically removing them (Prithvis) to Secunderabad."[49] This, in effect, created a unilateral non-deployment zone near the border for these systems. Again, in the spring of 2002, reported missile movements heightened tensions between India and Pakistan. Therefore, the need remains to address missile deployment scenarios.

Monitoring of a missile non-deployment zone could be conducted using commercial satellites, national technical means, periodic inspections, or with cooperative aerial monitoring. In addition, declared storage locations could be monitored by means of on-site sensors and camera systems.

The Open Skies Treaty is a model for cooperative aerial overflights in the context of the Conventional Forces in Europe (CFE) Treaty. It permits jointly staffed aircraft to fly over the territory of another state in order to confirm the absence of prohibited military buildups. After many years awaiting ratification, this multilateral agreement entered into force in 2002.

However, over the past decade many trial flights over the United States, Russia, and Europe have taken place. On a smaller scale, the bilateral open skies regime established between Hungary and Romania might prove to be a more valid precedent for consideration by India and Pakistan. In either case, the goal would be to establish protocols for periodic or challenge overflights of the missile non-deployment regions to confirm the absence of missiles. In 2001, retired air marshals from India and Pakistan conducted an analysis of the potential for cooperative aerial monitoring in South Asia.[50] Challenges include establishing timely overflights and dealing with concerns over intentional concealment of missiles. A comprehensive monitoring regime would employ several monitoring techniques to enhance confidence in the agreement. The use of tags to uniquely mark inspected missiles could help ensure compliance with agreed notifications of missile movements.

Launch Barriers

Another technique proposed to de-alert a missile system is the use of launch barriers. These physical or electronic systems would be designed to add time to the process of reconstituting missile forces. If attempts to remove the barriers were monitored, the time delay would give an adversary added warning time; time that would be devoted to peacefully resolving disputes before further escalation. As with most concepts for cooperative monitoring, there are varying degrees of intrusiveness associated with monitoring systems. The benefits to stability need to outweigh the vulnerability risks of permitting direct monitoring of missile positions and status.

Physical barriers would be designed to delay access or prevent movement. One example might be a massive weight such as a block of concrete that is placed in front of a storage bunker for warheads or missiles. This barrier would have to be removed to gain access to the storage area. Use of remote monitoring systems that included sensors such as pressure switches, motion sensors, and/or cameras could be put in place to monitor such movement. The time delay introduced by the presence of the barrier would permit detection and opportunity for those monitoring the bunker to raise concerns or prepare their own response.

Another example of a physical barrier might be an attachment on the missile or missile launcher that makes it inoperable without first being removed. In addition to providing added security against unauthorized or accidental launch, the status of this "lock out" mechanism could also be monitored to provide advanced warning to an adversary of potential threats.

Introducing electronic components to prevent immediate use might also be possible. Timers could be employed that require a fixed time interval before opening or unlocking the missile system or a physical barrier. Similar technologies are integrated, for instance, into bank vault doors that cannot be opened outside of authorized banking hours. While these launch barrier concepts are technically feasible, there are no significant precedents for their use in missile monitoring.

De-Targeting and Self-Destruct Options

De-targeting involves putting harmless target coordinates into a missile guidance system. In this case, any accidental or unauthorized launch of a missile system would cause it to land in areas that would not harm individuals or provoke retaliation by an adversary. Examples could include targeting to broad ocean areas or uninhabited territory within one's own country. While this is primarily a symbolic gesture and would be difficult to verify, as a unilateral measure, it could provide significant value in event of an accidental or unauthorized missile launch.

A precedent for de-targeting was established in January 1994 when President Clinton and Russian President Yeltsin agreed in the Moscow Declaration that they would "direct the de-targeting of strategic nuclear missiles under their respective commands so that by May 30, 1994, those missiles will not be targeted."[51]

Self-destruct features are intended to permit manual or automatic destruction of a missile that is on an errant trajectory or is launched unintentionally. "There are no precedents for using these measures on operational missiles, but self-destruct commands have been used for safety purposes on US missile test ranges since the beginning of the US missile program."[52] The missile test flights are so equipped in order to avoid risk to civilian populations in the case of a missile error or malfunction. By extension, this concept could be applied to ballistic missiles in the possession of military forces.

Other Limits and Controls

In addition to the non-deployment and de-alerting concepts presented, it is important to acknowledge other ways in which to reduce the threats posed by ballistic missiles in South Asia.

Quantity Limits

The proliferation of numbers as well as types of missiles would increase the chances of accidents, unauthorized use, and crisis instability. Many of the Cold War nuclear arms control treaties between the United States and the former Soviet Union were based on limits on delivery systems rather than warhead limits. It is possible to set quantity or production limits designed to limit the magnitude of the missile threat. In those cases, production monitoring and inspection to ensure compliance with agreed limits could be implemented. Under the Intermediate Range Nuclear Forces (INF) Treaty, the United States and Russia maintained production monitoring equipment and personnel at missile production sites in each other's countries for 13 years. This was done in order to ensure that no further production was carried out of the Russian SS-20 and U.S. Pershing missiles banned under terms of the treaty. In these cases, portal/perimeter monitoring was conducted

that permitted an assessment to be made of shipments exiting production facilities. Production areas inside of the facilities were not inspected. Therefore, in considering any monitoring regime, the areas to be monitored are subject to negotiation and mutual agreement. Under terms of the INF treaty, these extensive inspection provisions ended in May 2001.

Setting limits not only on production but also on total inventories of missiles would require more intrusiveness to develop high levels of confidence in compliance. In this case, the number of weapons systems of a particular type that exist would be declared, then a baseline inspection process undertaken to confirm the declaration. It might be necessary to uniquely identify the items inspected using high-security tags to ensure the accuracy of the count. Any items discovered subsequently without tags would be in violation of the agreement.

Enforcing quantity limits might also necessitate monitoring missile destruction. If reductions in missile inventories were agreed upon, approved methods for missile destruction and elimination would be required. A variety of elimination methods would be employed. Cutting, exploding, or even launching missiles as test flights have been agreed on in past treaties as means for reducing missile inventories. The goal in each case is to ensure that missiles are eliminated and cannot be repaired for use.

Capability Limits

Another means for reducing the escalating threats associated with missiles is to place limits on the capabilities or types of missiles developed. Capability limits would include such items as size, range, payload capacity, or multiple warheads. Agreeing early to such limits could limit the scope of any missile arms race. Similarly, decisions to limit basing schemes for missiles, such as sea- or submarine-launched systems, could also limit the scope of the concerns.

As in the case of the INF treaty, capability limits in South Asia could seek to eliminate or prevent development or deployment of an entire category of missile system. Compliance determination with such an agreement would require inspections to verify the absence of any restricted systems. Depending on the nature of the restrictions, it might also be possible to provide technical monitoring at production facilities to ensure no production of prohibited items.

Missile Trade Limits and the Missile Technology Control Regime

Because missile systems are not necessarily indigenous products, control of missile threats must address the commerce of missiles. Beginning in 1987, seven countries met to establish the Missile Technology Control Regime (MTCR). At present 32 countries are participants. The regime recognizes the role that trade plays in missile proliferation. The MTCR set guidelines

for commerce in missile-related technologies and components. Both India and Pakistan have been impacted by MTCR guidelines.

In February 2002, more than 80 countries met to evaluate an International Code of Conduct (ICoC) Against Ballistic Missile Proliferation. Both India and Pakistan attended. This proposed political agreement would have each signatory outline its ballistic missile program once a year and provide notification of ballistic missile tests.[53]

An important element of missile control in South Asia would be the need to address the role of third countries in assisting missile programs in India and Pakistan. This is clearly a sensitive issue and one that most likely will come much later in any missile dialogue between the two countries.

Administrative and Technical Use Control

The threat posed by missile and weapon systems could be reduced if more extensive administrative and technical use-control measures are implemented. Use-control measures are those procedures, hardware items, or software that limit or restrict access or use of a weapon system. Use-control systems could be effective in preventing not only external threats to unauthorized use but even to control use by those who are authorized. An example is use of a permissive action link (PAL) that requires two authorized individuals to work together to gain access to the system or enter commands for its use.

The generally highly classified nature of weapon use-control systems makes their cooperative implementation unlikely. However, unilateral implementation of use-control principles could help safeguard missile systems within each country and reduce the likelihood of unauthorized use.

Some have suggested that the nuclear-weapon states recognized under the Non-Proliferation Treaty (NPT) share information on nuclear command and control with India and Pakistan as a means for enhancing safety and security. Lingering concerns over Indian and Pakistani nuclear testing and their position outside of nuclear treaty regimes make such cooperation difficult. Debates over providing support for command and control will continue.

Verifiability of CBMs

Not all CBMs lend themselves to independent verification. Policies such as "No-first-use" and "de-targeting" are difficult to verify. In some cases, the starting point for cooperation and introduction of CBMs may be unilateral rather than cooperative. For example, choosing to share test-flight information, even unilaterally, could prevent misinterpretation and preemption on the part of the other side. Similarly, storing liquid-fueled missiles unfueled, or separating warheads from missiles decreases the likelihood of accidents or unauthorized use whether both sides agree to the idea or not.

Finding ways to confirm unilateral actions through cooperative measures should help to build confidence and further reduce the likelihood of unintended consequences. As more CBMs are proposed or implemented, there

would be a need to provide greater levels of verification to ensure compliance with agreements. Verification might come in the form of manned inspections of production, storage, test, or deployment locations. It might also include ever-more capable sensor systems designed to detect and characterize activities of interest. Assessing activity levels, monitoring movement, and providing unique identifiers for equipment are examples of applicable technology tools. Ensuring reliability and integrity of data collected would be essential to establishing confidence in monitoring systems. There is no single correct way to implement these concepts. Rather, monitoring options would be based on a complex set of criteria that are both technical and political in nature. It is possible to start slowly and increase the extent and sophistication of monitoring as experience dictates.

Synergism Among CBMs

While no monitoring system is 100 percent effective, the goal is to design a system with sufficient redundancy, and a variety of human and sensor measurement capabilities to provide high levels of confidence in the monitoring results. While many of the missile non-deployment and limitation CBMs have been presented as single, unique options, they could be combined to create more complete missile control regimes in the Subcontinent. For example, notifications of missile test launches could be augmented with invitations to permit observers to view the test launches. Unilateral declaration of non-deployment zones for missiles could be enhanced with permitted inspections to verify the absence of missiles in the area. Agreements to store missile components could be verified with on-site monitoring technologies that are designed to detect entry into the storage facilities. Similarly, a layered use of monitoring systems makes efforts to circumvent their purpose more difficult. As more layers of CBMs are implemented, a greater confidence level can be achieved.

Not only is it important to evolve adequate mechanisms for verifying missile agreements, it is also necessary to ensure adequate mechanisms for addressing disputes that arise. If anomalies or violations are detected, it is incumbent on the parties to seek adherence to agreement obligations, peaceful resolution of disputes, and escalation control. This is especially true in a nuclear and missile-equipped South Asia.

Importance and the Next Steps

Possessing missile systems carries with it multiple risks, including accidents, misinterpretation of threat, and unauthorized use as well as the potential for theft or loss. Missiles also pose the risk of extreme devastation associated with a nuclear detonation or the health risks associated with less catastrophic, non-nuclear detonations that scatter nuclear materials. Therefore,

political leaders must place a high priority on controlling missile threats in South Asia.

The concepts described represent a wide range of possibilities. However, political will and other factors do not make all of these notions equally likely in the near term. Figure 5.2 summarizes the ideas presented and a sequence in which they might be implemented. The first step must be a willingness to address the issues. Establishing a dialogue on missile threats is essential. Initially, the dialogue could be limited in scope with more issues addressed as success and conditions warrant.

Next, it is important to limit adverse consequences from systems that are already in place and that could create instability in the short term. Formalizing notification processes that prevent surprise or misinterpretation are among the highest priorities. Also, agreeing to maintain missile systems in a non-deployed and/or de-alerted state minimizes the safety, security, and use-control risks associated with maintaining missiles on alert. Structuring missile tests with flight trajectories away from the other country could also be useful in minimizing chances of misinterpretation of threats. Working to establish the necessary infrastructure for sharing information accurately and in a timely manner is also essential.

Expanding the dialogue to address possible monitoring options in support of missile limits will be important. Due to the great distrust that characterizes India–Pakistan relations, it is important that adequate verification be incorporated in missile agreements. Without it, agreements might not be reached or could flounder in their implementation. Non-threatening experiments could be proposed to build confidence in technical monitoring and inspection procedures. This "try before you buy" concept could help in structuring acceptable agreements to limit missile threats. The process of working together on such experiments could itself be a CBM.

Near Term	Mid Term	Long Term
• Begin missile dialogue • Establish/expand hotline and data-sharing communications infrastructure • Provide and formalize missile launch notifications • Maintain unilateral non-deployed missile status including non-deployment areas • Seek other means for minimizing misinterpretation, e.g. trajectory of test launches	• Set missile capability limits • Formalize limits on missile trade • Implement and monitor launch barriers • Establish and monitor missile non-deployment zones • Provide declarations of missile force structures/quantities • Define and conduct missile-monitoring experiments	• Establish and monitor missile quantity limits or elimination regimes • Monitor system or component removal and missile de-alert status • Verify missile use-control • Formally establish or participate in missile-control regimes

Figure 5.2 Missile threat-reduction time frames

Finding ways to limit the vertical proliferation of missile capabilities within the region could also be productive. It is generally easier to agree not to do something than to reverse that which has already been done. Examples of such limits might include agreeing to not have multiple, independently targeted reentry vehicles (MIRVs) or not to have surface ship- or submarine-based nuclear missile capabilities. Beginning the process of implementing specific control agreements on activities, quantities, production, testing, deployment, storage, use control, trade, and other elements of a missile life cycle would further the aim of regional stability.

In the absence of a dialogue on these issues, it is still important for both sides to carefully consider unilateral actions that enhance stability. This has been done in the case of missile launch notifications. Expanding these unilateral CBMs may be an effective first step in leading to the establishment of a bilateral or multilateral dialogue.

CONCLUSION

South Asia continues to be viewed as among the most volatile regions in the world. The escalation of missile development in the Subcontinent serves to further undermine regional stability. There is a need to begin to work to set limits on missile proliferation in the region and to provide stability mechanisms for systems that already exist.

The process must begin with a political will to address the missile issue. A threat-reduction and monitoring regime cannot fully develop unless there are efforts to effectively manage the political disputes between the countries. Elements of the Lahore Agreement in 1999 showed some evidence of that political will. Subsequent informal efforts to share missile launch information are a step in the right direction. Continued progress would involve establishing the necessary infrastructure for information sharing and dispute resolution. Providing formalized notification processes and agreeing to set limits on missile quantities, deployment, and basing would contribute to tension reduction.

Establishing a missile threat-reduction dialogue might lead to a framework for risk-reduction measures. Agreement on monitoring and verification mechanisms would be an important element of moving forward on setting limits and minimizing threats. Using a variety of technologies and inspection protocols, missiles could be monitored and inspected throughout their life cycles from development to final retirement or disposition. This process would require some level of intrusiveness. A careful balance must be struck between the benefits and risks of transparency to achieve stability. A role may exist for other nations in supplying advice and technology to implement monitoring of agreed regimes.

Prior to formalized agreements, unilateral measures or limited scale, cooperative experiments could be undertaken to demonstrate and evaluate the effectiveness of monitoring options. The potentially devastating consequences of accidents, unauthorized use, or misinterpretation of threats require that India and Pakistan find common ground for dialogue and action.

Notes

1. This work was supported by the United States Department of Energy through the Cooperative Monitoring Center at Sandia National Laboratories. Sandia is a multi-program laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy under Contract DE-AC04-94AL85000. An earlier version of this essay was originally published in Kent Biringer, *Missile Threat Reduction and Monitoring in South Asia*, report no. 38 (Washington, DC: The Henry L. Stimson Center, June 2001), 59–82.
2. This section is a compilation of missile capabilities in the region, as reported in the public media.
3. Nazir Kamal and Pravin Sawhney, "Missile Control in South Asia and the Role of Cooperative Monitoring Technology," SAND98-0505/4 (Albuquerque, NM: Sandia National Laboratories, October 1998).
4. Federation of American Scientists (September 9, 2000), Internet: www.fas.org/nuke/guide/india/missile/prithvi.htm.
5. "Prithvi Missile Successfully Test-fired," *Hindustan Times* (India) (December 12, 2001), Internet: www.hindustantimes.com.
6. "Sea-launched Missile Dhanush Test-fired," *Hindustan Times* (India) (September 21, 2001), Internet: www.hindustantimes.com.
7. "Dhanush Missile Seen as Ill-conceived System," *News India Times* (March 1, 2002), Internet: www.newsindia-times.com.
8. "India to Make 300 Prithvi Missiles," the *Hindu* (India) (September 8, 2000), Internet: http://www.hinduonnet.com.
9. "Govt. Denies Report on Prithvi Production," the *Hindu* (India) (September 9, 2000), Internet: http://www.hinduonnet.com.
10. "Developing a Delivery System," *Frontline* (India) vol. 16, no. 9 (April 24–May 7, 1999).
11. "India Test Fires Agni Missile Ahead of Republic Day," *Space Daily* (January 25, 2002), Internet: www.spacedaily.com.
12. "Agni Missile Ready for Serial Production," *Hindustan Times* (India) (August 29, 2000), Internet: http://www.hindustantimes.com.
13. "Developing a Delivery System," *Frontline* (India) vol. 16, no. 9 (April 24–May 7, 1999).
14. "Agni II Ready for Induction: Fernandes," the *Hindu* (India) (February 7, 2001), Internet: http://www.hinduonnet.com/.
15. Ibid.
16. "Pakistan Rejects Reports on Missiles," *Associated Press* (July 3, 2000).
17. Federation of American Scientists (March 9, 2000), Internet: http://www.fas.org/nuke/guide/pakistan/missile/hatf-1.htm.
18. "Pakistan Test-fires Hatf-1 Missile," *Dawn* (Pakistan) (February 8, 2000), Internet: www.dawn.com.
19. Ibid.
20. "Pakistan: Three Days, Three Missile Tests," *NTI: Global Security Newswire* (May 28, 2002), Internet: www.nti.org.
21. "Ranges and Current Status of Indian, Pakistani and Chinese Missile Programmes," *Jane's*, Internet: http://www.janes.com.
22. Federation of American Scientists (September 9, 2000), Internet: http://www.fas.org/nuke/guide/pakistan/missile/hatf-4.htm.

23. Federation of American Scientists (September 9, 2000), Internet: http://www.fas.org/nuke/guide/pakistan/missile/hatf-2.htm.
24. *Dawn* (Karachi) (December 19, 2000), Internet: http://www.dawn.com.
25. Muralidhar Reddy, "Pakistan Claims Shaheen Inducted into Army," the *Hindu* (India) (January 27, 2001).
26. "Pakistan's Ballistic Response," *Frontline* (India) vol. 16, no. 9 (April 24–May 7, 1999).
27. Muralidhar Reddy, "UFOs were Ghauri-III Fragments," the *Hindu* (India) (August 24, 2000).
28. "Pakistan: Three Days, Three Missile Tests," *NTI: Global Security Newswire* (May 28, 2002), Internet: http://www.nti.org.
29. "Ghauri Missile" (September 9, 2000), Internet: http://www.pakmilitary.com/army/missiles/ghauri.html.
30. "Pakistan Test Fires Ghauri-II," the *News* (Pakistan) (April 15, 1999).
31. Scott D. Sagan, *The Limits of Safety: Organizations, Accidents and Nuclear Weapons* (Princeton, NJ: Princeton University Press, 1993).
32. Alex Deley, "Are Nuclear First-Strike and/or Launch on Warning Policies Becoming Inevitable?" Congressional Briefing Paper (Chicago: Bertrand Russell Society, April 1983).
33. Elaine Monaghan, "Russia, US, Cut Risk of Inadvertent Nuclear Strike," *Reuters* (December 16, 2000).
34. "India's Letter to Clinton on Nuclear Testing," *New York Times* (May 13, 1998).
35. "India Successfully Tests its Nuclear-Capable Agni II Ballistic Missile," Carnegie Endowment for International Peace (January 18, 2001), Internet: www.ceip.org/files/nonprolif/templates/article.asp?NewsID=86.
36. Agreement on the Maintenance of Peace and Tranquility in the Border Areas Along the Line of Actual Control, Beijing (September 7, 1993); Agreement Between the Government of the Republic of India and the Government of the People's Republic of China on Confidence-Building Measures in the Military Field Along the Line of Actual Control in the India–China Border Areas, New Delhi (December 1996).
37. Bill Gertz, "China Aids Pakistani, 'Rogue' Missile Programs, CIA Says," *Washington Times* (February 27, 2001).
38. Memorandum of Understanding signed by Indian Foreign Secretary K. Raghunath and Pakistan Foreign Secretary Shamshad Ahmad in Lahore (February 21, 1999), Internet: www.indianembassy.org/South_Asia/Pakistan/mou(lahore01211999).html.
39. Michael Krepon, Jenny S. Drezin, and Michael Newbill, eds., *Declaratory Diplomacy: Rhetorical Initiatives and Confidence-Building*, report 27 (Washington, DC: The Henry L. Stimson Center, May 1999).
40. Ibid.
41. "Missile Tests and the Lahore Spirit," the *Hindu* (India) (April 14, 1999), Internet: http://hinduonnet.com.
42. "Pakistan Test-Fires Ghauri-II," the *News* (Pakistan) (April 15, 1999).
43. Sanjeev Miglani, "India Tests Nuclear-Capable Agni II Missile," *Reuters* (January 17, 2001).
44. "Pakistan to Launch Missile Tests," *Hindustan Times* (India) (May 24, 2002), Internet: http://www.hindustantimes.com.
45. P.R. Chari, "Declaratory Statements and Confidence-Building in South Asia," in Krepon et al., eds., *Declaratory Diplomacy.*

46. Elaine Monaghan, "Russia, US, Cut Risk of Inadvertent Nuclear Strike," *Reuters* (December 16, 2000).
47. Michael W. Edenburn et al., "De-Alerting Strategic Ballistic Missiles," Cooperative Monitoring Center Occasional Paper/9, SAND98-0505/9 (Albuquerque, NM: Sandia National Laboratories, March 1999).
48. R. Jeffrey Smith, "India Moves Missiles Near Pakistani Border," *Washington Post* (June 3, 1997).
49. Raja Menon, *A Nuclear Strategy for India* (New Delhi: Sage Publications, 2000), 202.
50. M.A. Chaudhry and K.C. Cariappa, *How Cooperative Aerial Monitoring Can Contribute to Reducing Tensions Between India and Pakistan*, SAND98-0505/22 (Albuquerque, NM: Sandia National Laboratories, December 2001).
51. Text of Moscow Declaration by President Clinton and Russian President Yeltsin, Moscow (January 14, 1994).
52. Michael W. Edenburn et al., "De-Alerting Strategic Ballistic Missiles."
53. "Rules for the Road: The International Code of Conduct Against Ballistic Missile Proliferation," *Disarmament Diplomacy* no. 63 (March–April 2002).

This page intentionally left blank

6

Nuclear Risk Reduction and Cooperative Aerial Observation

John H. Hawes and Teresita C. Schaffer

The May 1998 nuclear tests by India and Pakistan transformed the strategic environment in South Asia.[1] They did not, however, change the military potential in the region. India had already proven, 24 years earlier, that it was capable of a nuclear test, and Pakistan was confidently believed to have the same capability. By making this capability overt, India and Pakistan increased perceptions of both their own power and their vulnerability. The tests raised the political stakes in their bilateral confrontation and heightened the risks inherent in what had become a routine level of hostility between the two countries.

Since that time, India–Pakistan relations have been marked by serious crises and clashes. For many observers, this dangerous situation reinforces the importance of providing some insurance against a catastrophic conflict that no one wants. In general, the menu of possible nuclear risk-reduction measures falls into three categories:

- Measures to improve communication and inhibit accidental confrontation between conventional forces;
- Measures, typically adapted from the Cold War era to fit South Asia's particular circumstances, to improve internal control and avoid miscalculation with nuclear and missile forces; and
- Measures to improve India–Pakistan relations, including measures related to Kashmir.

Between 1988 and 1992, India and Pakistan implemented a number of confidence-building measures (CBMs). These included establishment of hotlines at several different levels of command and an agreement whereby the Directors General of Military Operations (DGMOs) for each side would, in turn, initiate a weekly call. Other measures focused on the structure of military exercises, the notification of certain types of military movements, and the banning of military overflights of each other's territory.[2] All but one of the formal agreements setting up CBMs came in the wake of a near-confrontation

between the two countries in 1990, and reflected the experience gained on that occasion. These measures were negotiated and implemented bilaterally, an important point for India. Pakistan and India were quietly encouraged by other countries, however, and the experience of Cold War–era CBMs between conventional forces in Europe had parallels in some of the ideas that eventually materialized in a form suitable for the Subcontinent.

A general downturn in India–Pakistan relations caused these measures to atrophy within a few years of their inception. More recent bilateral efforts have focused chiefly on resuming a high-level diplomatic dialogue. On two occasions, in June 1997 and February 1999, India and Pakistan agreed on procedures to resolve outstanding issues in an integrated, bilateral manner in a series of working groups. Those concerning broad peace and security issues, including CBMs, and Jammu and Kashmir were to be given special emphasis. Others would deal with disputes such as Siachen Glacier, Wullar Barrage/Tulbul Navigation Project, and Sir Creek; as well as economic and commercial cooperation matters and friendly exchanges in other fields. Each of these declarations was followed within less than a year by a dramatic downturn in the nuclear tests in the first case, and a near-war when the Pakistan government sent troops across the Line of Control (LoC) at Kargil in the second. A military takeover in October 1999 brought to power the general who had been Chief of Army Staff at the time of Kargil, and hence key to that operation's execution. Since that time, the scope for political dialogue has been severely limited. Two ceasefires offered hopes for an expanded dialogue between India and Kashmiri dissidents, but ultimately came to nothing. One India–Pakistan summit in the summer of 2001 ended without any agreed statement, and with bilateral tempers badly frayed.

In the wake of the terror attacks directed at the World Trade Center and the Pentagon on September 11, militant groups based in Pakistan, fearing that the changed Pakistani political environment would clip their wings, became even more active in Kashmir. Their most dramatic operation was an attack on the Indian parliament in December 2001. This triggered another war scare and a massive Indian deployment of troops on the border and LoC, which Pakistan soon matched. Pakistan's political response to this event—a dramatic speech by President Musharraf promising to rein in the militants and impugning their patriotism—has only been partly effective.

There is no real consensus in either India or Pakistan on what these events mean for the two countries' future relations. Hawks in both countries toy with the idea of "limited war," exploring—at least intellectually—the scope for military operations below the nuclear threshold. In Pakistan, such thinking centers on maintaining a low-intensity conflict in Kashmir; in India, it centers on searching for military options that will punish or prevent infiltration without triggering a nuclear response.

More sober thinkers in both countries and elsewhere, however, have drawn a different conclusion: that the time is ripe for India and Pakistan to establish a more robust risk-reduction regime. New arrangements could build on the strengths of the 1990 experience: fruitful bilateral negotiations

and attempts to identify and avoid behavior that could be subject to dangerous misinterpretation by the other side. At the same time, a new effort at bilateral nuclear risk reduction should also try to remedy some of the weak points of the past, and to take account of the increased suspicions developed since 1999. The earlier arrangements were not very effective in helping India and Pakistan communicate about military capabilities and intentions in such a way as to defuse a budding crisis. The only communication measures included in the 1988–1992 package were the hotlines, and these were the first measures to fall out of regular use. The buildup to the 1990 crisis had been punctuated by recurring alarms, in both India and Pakistan, about purported preparations for offensive military action. At that time, credible reporting from third countries, including the United States, reduced anxieties. The provision of information by third parties can be useful, and the United States is now in an even stronger position than it was in 1990 to provide this kind of bridge. However, a third-party role is not an ideal basis for lasting crisis stability. The security of both countries would be greatly strengthened if they each had direct access to reliable information, developed and shared on a bilateral basis, without having to depend on third parties.

Developing a new nuclear risk-reduction package is fundamentally a job for the two countries at primary risk. It must be supplemented by a serious, ongoing India–Pakistan political dialogue. In the years subsequent to the 1990 crisis, communication channels and intelligence assessments have remained poor, while nuclear dangers have grown as was evident in the Kargil crisis of 1999 and the mobilizations for war in 2002. Any new effort to reduce risk in these circumstances must be based on an explicit understanding that both countries have decided to turn away from military means in managing their bilateral dispute.

A risk-reduction effort will be most successful if India and Pakistan have a broad array of measures to choose from. This essay analyzes one potentially useful ingredient in the mix: a program of cooperative aerial observation. Cooperative military activity flies in the face of a well-established practice in India and Pakistan of avoiding direct interaction between the two military establishments. This is understandable in political terms. And yet in some other tense regions, notably the Middle East, military officers have actually found it easier than their civilian counterparts to communicate, once the ground rules are set. Military officers have a vocabulary, a rank structure, and a tradition in common, and their training includes concepts of how to deal with adversaries. More importantly, military officers understand better than anyone the risks of misunderstanding.

India and Pakistan have concluded one agreement concerning aerial activities defined in a 1992 agreement banning overflights of one another's territory by Indian and Pakistani military aircraft. Like the rest of the 1988–1992 package, however, it atrophied when bilateral relations went sour.[3] At least two techniques have been used or attempted internationally to give potential adversaries agreed access to aerial observation. The Open Skies Treaty, negotiated between the North Atlantic Treaty Organization and Warsaw

Pact states at the end of the Cold War, involved direct observation by the participants. The treaty entered into force on January 1, 2002. The security arrangements accompanying the Egyptian–Israeli peace agreement included provision for third-party flights generating identical data. These data were provided to both sides, and coupled with a network of observer stations in Sinai whose primary purpose was to give Israel some of the warning time it had relinquished. The proposal presented here is a variant on the Open Skies model, adapted for the different political and security circumstances in South Asia. Direct observation has the advantage of being more meaningful to the country doing the observing. Moreover, it fits better into the history of direct bilateral dealings between India and Pakistan.

Principles for Aerial Observation

The basic concept is a simple one: India and Pakistan would each agree to carry out an equal number of flights over their own respective national territories using identical surveillance cameras. An identical set of the film produced by each country's flights would be provided to both sides. In addition to its own aircrew, each country would also host representatives from the other country on board its aircraft during the observation flights. The flights would give both sides common baseline information and a tool for assessing threat information they might receive from other sources.

While the concept is simple, aerial verification can be implemented in more or less ambitious ways, depending on how the governments involved calibrate the tradeoffs between gaining and relinquishing information. The parties would need to agree on the number of flights, their duration, and the capabilities of the cameras used. They would need to weigh these and other factors against the security objectives they set for the program and the political constraints on bilateral agreements. One could begin modestly, for example, providing for very few flights over a limited number of pre-designated sites. Such a small program would demonstrate an ability to work together to share information. It could help to defuse potential crisis situations even though the information it yielded would necessarily be of limited scope. To the degree, however, that both parties were interested in sharing information more extensively, they could design a program either with a greater number of flights or expanded territorial coverage, or they could work up to a more extensive program gradually. Some of the options are considered below.

In our judgment, four key principles would have to guide an India–Pakistan aerial observation program. These are:

- No overflight by foreign aircraft;
- A strict focus on gathering information;
- At least as much concern for conventional forces as for nuclear capabilities; and
- Continuing dependence on mutual cooperation.

A brief discussion of each of these points follows.

No Foreign Overflight

For both political and military reasons, neither India nor Pakistan is likely to accept the use of foreign observation aircraft within its national airspace. Therefore, all observations under the proposed measure would have to be accomplished using Indian aircraft in Indian airspace, and Pakistani aircraft in Pakistani airspace. In each case the aircraft would carry dual sets of cameras, to provide both parties equal records of the imagery. Similarly, in each case the host country would carry an observation delegation from the other country on its aircraft for the duration of the observation flight, so that both parties could be satisfied that the observation plane followed an agreed route and that the photographs that were taken corresponded to the sites and times that had been agreed upon.

It is worth recalling that the issue of host country versus visiting country aircraft was a major point of contention between the former Soviet Union and other participants in the Open Skies Treaty negotiations. At that time, the former Soviet Union took the position that the host country had to provide the aircraft to guarantee that the observation aircraft did not contain weapons or hidden sensors not permitted under the agreement. Conversely, the other participants in those negotiations were concerned that a host country aircraft might be too easily subject to diversion from important sites or that the aircraft or its on-board sensors might suffer unexplained technical malfunctions, which would interfere with or force the cancellation of an observation flight. They therefore attempted unsuccessfully in the event to alleviate Soviet concerns by providing for rigorous pre-inspection of the aircraft.

The position taken by the former Soviet Union probably best reflects the current military and political realities between India and Pakistan. By using only host country aircraft for observation missions, both countries could avoid arousing unnecessary suspicions and security concerns. Moreover, this is the only formula that would make it possible for the parties to develop the positive security benefits of an observation program from the start. Conducting observations in this manner, of course, would place the burden on the host country to ensure that its observation aircraft were operationally ready when needed, that its crews and flight controllers were thoroughly trained for cooperative observation missions, and that there were no untoward incidents. There is always potential for misunderstandings and disputes in the event that one or the other party were to believe that the other side was improperly using its control of the observation aircraft to impede access to important information. Even inadvertent errors or malfunctions could be mistaken for deliberate interference. This possibility could be, however, minimized after both parties gain operational experience in carrying out missions. This poses a much smaller risk than the danger of misunderstanding and miscalculation that would exist in the context of an observation program conducted by foreign aircraft, or in the absence of an observation program altogether.

Informational Focus

Because an observation measure could potentially "see" anything on the ground it covers, it would have to be clearly understood by the parties that the mere gathering of information did not itself imply any limitation or constraint on the equipment or forces that might be observed. This distinction is important to make because many people tend to confuse observation with limitations, and any such confusion could lead to misunderstandings between the parties, or even prevent the successful conclusion of an observation agreement. This confusion may come from the fact that several observation programs elsewhere in the world were instituted for purposes of monitoring specific territorial constraints or arms control agreements, including, for example, the Egyptian–Israeli disengagement in the Sinai or the U.S.–Soviet reduction of missiles under the Strategic Arms Reduction treaties. In the case of India and Pakistan, however, there are currently no agreed geographical, quantitative, or qualitative limitations on military capabilities.

A cooperative aerial observation program would simply make factual observations rather than monitoring an agreement. The parties might note, for example, that a certain number of weapons of "x" type were or were not deployed in "y" region, or that several units of "z" size had or had not moved from region "a" to region "b." Such factual observations could deal with both nuclear-capable and conventional forces, and would be valuable to the parties in assessing their security situation, particularly during a crisis. This risk-reduction function could be performed independently of the existence or non-existence of any constraints on force deployments. At the same time, should the parties at some point decide to institute either formal or informal limitations on deployments, say in a particular geographic area, the existence of the aerial observation risk-reduction program would provide a ready-made means of also providing both countries with reliable information on such limitations.

Broad Scope

Any observation program that is designed to make a serious contribution to risk reduction must give at least as much attention to the conventional forces of India and Pakistan as to their nuclear programs. Notwithstanding the role that the two countries' nuclear programs have played in stimulating renewed interest in mitigating the risk of conflict, conventional forces remain the most important indicators of the likelihood or unlikelihood of major conflict. Because conventional forces would almost certainly be the first to be committed in any major conflict, observation of their movements would be especially valuable in determining whether a conflict was imminent. Also, the size of conventional force units and the range of major equipment they contain make the task of observation relatively straightforward. Rather than looking for the proverbial "needle in a haystack," observers can follow the activities of a series of specific "haystacks" in specific areas. This approach would of course not

provide advance warning of an operation that started with covert infiltration of forces, as at Kargil, but one cannot expect aerial observation or any other individual tool to detect all sources of danger. In terms of the possible risk of escalation to the use of nuclear weapons, most scenarios suggest that such use is most likely to be considered by the parties in the context of a conflict that had already developed at the conventional level. While there has been much concern about the possibility of a preemptive strike, a fear perhaps heightened by the relatively small size of the nuclear-capable forces involved, no sane planner on either side could be completely confident of wiping out the other side's nuclear forces. This makes preemption an unacceptably risky strategy. A "bolt from the blue"—an unexpected nuclear attack without a previously existing crisis or conflict involving conventional forces—is the least plausible scenario.

None of this means that an observation program should avoid looking at nuclear programs. As the May 1998 nuclear testing by both countries has reemphasized, nuclear weapons and their delivery systems possess enormous political as well as military importance. Consequently, both parties have powerful incentives to acquire the most complete and timely information possible on the nuclear capabilities of the other side. A cooperative observation program could facilitate that objective. For example, India and Pakistan have exchanged lists of certain nuclear-related facilities throughout their respective countries, which they have agreed not to attack. Periodic aerial observation of some or all of these facilities would not provide internal details of their programs, but it could be useful in assessing developments in the scope or direction of activity. In addition, aerial observation of garrisons and air bases—either nationally or in specifically designated regions that the parties believed were most significant for bilateral assessment purposes—would indicate whether or not certain nuclear-capable missile or aircraft delivery systems were deployed at those locations. This information on nuclear-capable deployments—or non-deployments—would itself be of significant importance in assessing a security situation.

In principle, allowing flights during periods of heightened tensions might provide some reassurance. However, in practice, going beyond the deployment information thus gained to make judgments about the likelihood of actual deployment of nuclear capable systems in a crisis, is probably beyond the capacity of a cooperative aerial observation arrangement. Agreed limits on the number of flights, the time delays between observation flights, and the tight security that necessarily surrounds all nuclear activities, would reduce the ability of either party to gain hard information on the possible nuclear employment intentions of the other party.

This reinforces our view, noted above, that a meaningful risk-reduction program must also focus heavily on giving national military and political leaders sufficient information about the conventional force deployments of the other side to enable them to make informed choices in a crisis. To the degree this can be achieved, the observation program could dampen the possibility of escalation at the conventional level, before the use of nuclear weapons might be considered.

Voluntary Cooperation

The strength and weakness of a cooperative observation program is its dependence on active cooperation between the parties. Aerial observation could only take place as long as India and Pakistan remained committed to the program and willing to fly observation missions over their own territory. Neither party could gain any information under the program without the participation of the other. Neither one could continue the program alone if the other backed out. In one sense, this is a guarantee for both parties. Either party could shut the program down immediately if it believed this were necessary. At the same time it is a risk, since the potential for either party to terminate the program means that the flow of information could be interrupted at any moment. Were one party to terminate the observation flights during a period of crisis, for example, the other party might interpret this action as an effort to hide aggressive preparations. It might, therefore, feel compelled to take offsetting actions, despite—or because of—the absence of hard information on what the other side was doing.

In one sense, an interruption of the observation program would only return both parties to the present situation, with its lack of information and attendant uncertainties. In another sense, however, a deliberate interruption of a successful observation program could be read as potentially more dangerous than the present situation, in that any closing down of information in a crisis—for whatever reason—could serve to magnify existing tensions. Because the observation program would depend on an agreement between sovereign states, its continuation would have to remain voluntary. At the same time, the parties would have to be conscious of the potential signals that they might send if they were to terminate the program.

Implementation of an Observation Program

Within the framework of the four broad points discussed above, a great deal of latitude for shaping the actual structure and operation of a cooperative observation program remains. The two parties would need to decide such questions as: the number and length of flights to be undertaken; the amount of national territory that is subject to observation; whether there should be any excluded areas; what quality of imagery should be produced; and, how cooperation between the host country and the visiting country would work in practice. In combination, the answers to these questions would constitute the detailed operational structure of an observation program. By definition, these are subjects for careful analysis and discussion between the parties. Here we can only begin to outline some of the possible factors that the parties might wish to consider in deciding these issues.

Area

India and Pakistan might decide to include several areas in an observation program. Options range from a relatively narrow strip along their common

border, to a selection of militarily relevant sites throughout each nation, to unrestricted coverage of most or all of the national territory of each party. Each of these options could be relevant to the basic objective of risk-reduction. Each, however, presents complications.

Coverage of the region immediately adjacent to the border could give information on the strength and movement of forces closest to a potential conflict zone. Because of this, both parties already exert considerable effort to acquire such information unilaterally, including using aerial photography directed across the border into the territory of the other party. Indeed, this can lead to aerial incursions, with all the risks that these entail, as happened at Kargil. Providing cooperative aerial coverage of the regions alongside the international border, as well as of the LoC dividing Kashmir, could significantly improve the quality and quantity of information available regarding the forces in closest proximity, while reducing the risk of an incident triggered by shooting down reconnaissance aircraft.

Defining the depth of a region subject to cooperative observation would be tricky. Is it to be defined, for example, as the strip 50 km deep on each side of the border, running parallel to the border northward from the Arabian Sea all the way to the Himalayas? Or should it be a strip of some lesser or greater constant depth? Or should the depth vary with location, based on geographic features, known force deployments, transportation routes, or other special factors? Would a strip of the same depth be appropriate for the international border as well as for the LoC, or would military or political considerations argue for different proportions in each case?

While the concept of a border strip is probably the easiest way to define the area of aerial observation, and might therefore represent a logical first step in any observation program, there are both political and military reasons why the parties might also want to consider observation of other regions, as well. In the first place, the force dispositions of the parties are such that, depending on the definition used, one or the other side could feel that it was giving more information than it was receiving if observation were limited to a zone close to a border. Or there might be concern that the establishment of a fixed zone of observation along a border would lead one or both parties to station forces just outside that zone, thereby defeating the purposes of the observation measure.

Second, regardless of how the depth of a border region is determined, both India and Pakistan will always have important forces stationed outside that area that could play a significant part in any conflict. Indeed, the movement or non-movement of conventional or nuclear-capable forces stationed at some distance from a border could be a more important indicator of future military developments than activity in the immediate border area itself. Third, because of the difference in overall size of India and Pakistan, it is apparent that a much greater percentage of Pakistan would be covered by an observation measure applied to border regions than the same measure would cover in India, and that, conversely, a higher percentage of Indian territory would be unobserved under such a measure.

For all these reasons, the parties might wish to consider including other areas. They might, for example, include all airfields within operational range of the border, and then add other designated military facilities that also fell within that range. This would cover most forces and equipment that could be immediately brought to bear on a potential conflict, and as such would provide essential information for risk reduction. Depending on the frequency of observations, such an approach would, in particular, be able to detect the introduction to known sites in the area of additional equipment or units, including, for example, nuclear-capable delivery systems. It would not, however, cover longer-range missiles that might be deployed outside the observed region, nor would it be able to pick up the redeployment of forces or equipment from outside the region to previously unknown sites within the region. Coverage of such forces or equipment would require either blanket coverage in the region, or coverage of designated military facilities outside the region where equipment of potential concern were deployed, coupled with coverage of road and rail lines of communication into the region.

The most extensive approach would be to include the entire territory of both parties, excluding certain distant regions too remote to be relevant to the balance between India and Pakistan. India, for example, might argue that Assam and the other territories in the northeast should be excluded from cooperative observation on such grounds. Pakistan might advance a similar argument with regard to its territory bordering Afghanistan. Similarly, both parties might wish to make exceptions on political grounds for their national capital areas. In order to be mutually acceptable to both parties, such potential exclusions would depend on whether they agreed that knowledge of the forces and activities in those areas was or was not material to the assessment of the military situation in a potential crisis.

Distance

Two elements are needed to determine the appropriate extent of a cooperative observation flight: first, the decisions the parties make regarding the area to be covered, as discussed above; second, the number and location of airfields from which observation flights could operate. Solely for purposes of this illustration, let us assume that each party would designate two or more airfields as observation bases. In each country, one of these airfields would be adjacent to the international boundary or LoC to facilitate coverage of this area. If the parties had agreed on coverage extending beyond a border strip, then a second airfield might be needed at a convenient point deeper inside the two countries. Hypothetically, the designated airfields might be Amritsar and Lahore in the area of the international boundary. The location of the other airfield would depend on the scope of the additional coverage.

With these hypothetical starting points, flights in the border and LoC regions would have to be long enough to make the round trip from Amritsar or Lahore to the Arabian Sea in the south or the Himalayas in the north. In

addition to calculating the straight-line distances, however, the flights would also have to be granted an additional allowance, perhaps 10 percent. This allowance would provide the flexibility necessary to maneuver laterally over the depth of the border and LoC areas and would ensure that the return flight track to the starting airfield did not have to simply duplicate the outbound track. Since the total length of the international border or the LoC is equal for both parties, it would be straightforward and equitable to define equal flight distances for both parties for any observation flight by either party in the border region.

For coverage of the rest of the two countries, flight distances would need to take account of the difference in geographic size between India and Pakistan. They might, for example, be calculated by drawing arcs based on the two designated airfields in each country, with the radius of the arcs reaching to the furthermost points in those countries that the parties had agreed to include in the cooperative observation program. As in the case of border area flights, the requisite flight distance would be sufficient to make a return trip along the radius of the arc, plus a 10 percent allowance for lateral maneuvering. With two airfields designated as starting points in each country, as in this hypothetical example, all points to be observed would have to fall within the arcs from one or the other airfield.

If a greater number of airfields were designated, the size of the respective arcs and the lengths of flight needed to reach all relevant sites in each country would be correspondingly less. Also, the question of the possible inclusion or exclusion of certain territories on the far borders of India and Pakistan, as discussed above, could be a significant factor in setting requirements for the length of flights. Finally, as a matter of practical logistics it might be necessary in some cases to identify refueling points for particularly long flights, depending on the type of aircraft chosen for the observation flights in each country.

Number

How many flights are enough? The question can only be answered by weighing the purposes of the observation program. If, for example, the objective were primarily symbolic confidence building, then a handful of flights per year in each country might suffice. In a positive sense, even a small number of missions would establish the principle of cooperative observation, demonstrate the feasibility of working together on a security issue, and provide some limited additional information. These are not trivial benefits, particularly in the present atmosphere. No one would argue, however, that such a limited program would provide the steady flow of information necessary to strengthen each country's understanding of the military situation and reduce the risk of escalation through miscalculation.

If the objective of the program were to provide each party with an annual survey of major elements of the other party's military order of battle, then a dozen flights might be required on each side. This, too, would be an important

advance. The operation of the program would itself represent a significant effort at cooperation and the information produced would refine understanding of the long-term situation. It would also have a certain utility as a risk-reduction measure, although the limited number of flights might not leave the parties with enough flexibility to conduct observations in a timely manner in a period of crisis. The parties could attempt to deal with this problem by utilizing some of the flights for routine information collection, while "saving" some for a potential crisis situation.

Finally, if the objective were to provide up-to-date information over an extended crisis period on the movement—or nonmovement—of forces and equipment, the potential requirement for flights could become very large. Particularly in times of tension, both parties could perceive a need for almost daily observation flights over an open-ended period of time. Moreover, were there to be an actual crisis, neither party would want to be placed in a situation where it could not obtain reliable information about important sites or activities because it had to worry about the rate that it was consuming a limited quota of observation flights. Such large numbers of flights, however, would be certain to encounter resistance on both logistical and political grounds. Host country observation planes and crews could only sustain high rates of operation for a finite period. Moreover, the political climate in both countries is such that any observation agreement would have to be subject to relatively tight numerical limits.

A related issue is the periodicity of flights. If scheduling is simply on an "as needed" basis, each country might feel that some political stigma is attached to making the initial request, as was the case with unscheduled hotline calls. One way around this situation, which also offers a means of addressing some of the issues raised above, would be to set up a certain number of regularly scheduled flights—say, one every two months—which would be flown routinely, without request. The countries could then agree on a number of flights outside this quota, which could be used on a reciprocal basis in times of increased tension if either country felt the need to reassure itself with more intense observation. They might, for example, agree on 12 such unscheduled flights each, to be used as needed—although for logistical reasons there would need to be a limit on how many could take place in any given month. This arrangement could provide "surge capacity" for periods of tension, with a limitation to avoid straining the resources of both sides.

Aircraft

If, as we assume, only aircraft operated by the host nation would be authorized to conduct observation missions under a cooperative program, India and Pakistan would choose the particular aircraft that they would use for the observation flights over their own territory. An observation aircraft of this type must be large enough to carry not only the cameras and related equipment, but also the host country crew and the representatives of the other party who would be carried on board as guests. To insure that an aircraft was

operational at all times, each country would probably have to designate and equip both a primary and a back-up aircraft. The internal configuration of the aircraft might, at a minimum, provide: work space for both host country and observer teams of approximately four people each, in addition to the host country's aircrew; dual sets of computer screens to automatically track the route of flight and the areas to be photographed; and links to the global navigation system. As discussed in the notes on sensors and processing, which follows, the planes would require a dual set of cameras, and other instruments if included, so that each party could receive negatives of the same pictures.

Flight Planning

Although all observation flights would be conducted by host country aircraft flown by host country crews, the flight route would be planned in advance by the party requesting the flight. As discussed above, the maximum length of an observation flight and the area subject to coverage would be fixed by mutual agreement of the parties. Within those parameters, the party requesting a flight would draw up a detailed flight plan, starting from a designated airfield in the host country and setting forth the headings and turning points of the route that it wished the host country aircraft to fly. The flight plan would also indicate the points at which photography is requested. The country requesting the flight would present this plan to the host country in advance of the flight, giving the host country time to prepare the crew and to notify air traffic control authorities along the flight route.

If the flight plan were consistent with the agreed length and area of coverage criteria, the host country would implement it as written. The parties could, however, provide for amendments to the flight plan to deal with unforeseen circumstances. One such possibility, for example, would involve a host country military training exercise involving live firing of missiles or maneuvering of combat aircraft, which could pose a danger to the observation aircraft. In this event, the host country might propose an amendment to the proposed flight plan to route the observation aircraft around the affected area, or to change the time of its arrival over the affected area to avoid danger from the exercise activity.

Sensors

The most important sensor to employ for a cooperative aerial observation program would be a high-quality optical camera. This camera would provide the broadest range of general purpose information. It is the simplest and least expensive system meeting the requirements of a cooperative effort, and the interpretation of its output is relatively straightforward. A case might be made for the inclusion of other sensors in addition to cameras. For example, a synthetic aperture radar would give the observation missions an all-weather, day and night capability, which optical cameras lack. The parties

might decide that such additional capabilities were important to have. A successful observation program devoted to risk reduction could, however feasibly, be operated with optical cameras alone. Moreover, we note that the technical aspects of establishing a cooperative observation program involving radars or other sensors could be significantly more complex. In any event, a program based on optical cameras would be a logical initial step, and radars or other sensors could be considered for eventual subsequent introduction if the parties so desired. Each party would be responsible for outfitting its own observation aircraft with the agreed equipment. Third parties might wish to offer relevant equipment or technical advice on its installation as a means of facilitating the implementation of the agreement.

To ensure equality of observational output, India and Pakistan would need to agree on the specifications of the camera systems to be installed on their aircraft. Apart from the overall optical and mechanical quality of the system, the primary factor to be considered is the resolution that the camera is capable of achieving. Both parties would want to ensure that the cameras installed on the other party's aircraft were capable of producing imagery with a certain minimum degree of resolution. Moreover, both parties would want to ensure that the required degree of resolution could be produced from a specified altitude above ground. The higher the altitude above ground from which the camera system can produce the desired resolution, the larger the area which can be effectively photographed from the aircraft on a given track. At lower altitudes, more flights would be required to cover the same areas on the ground, which would not be efficient from the point of view of either the host country flying the missions, or the visiting country designing the flight plans. For calibration purposes, the parties might set a nominal standard operating altitude, say for illustration, 6,000 or 10,000 meters. This would not limit the activity of observation aircraft during actual missions. It would, however, provide a yardstick for assessing whether or not the optical cameras met the required resolution standards.

In practice, modern aerial cameras can produce almost any desired degree of resolution from such altitudes. The parties would have to determine what minimum level of resolution was required to provide the information needed for risk reduction. They would also have to determine whether this minimum level should also be considered a maximum, or whether higher quality photography would be acceptable or desirable. The answers to these questions depend on the parties' assessment of the indicators they would need to identify to provide valid assessments of what is taking place on the ground. At one end of the range, for example, the parties might decide that they needed an ability to recognize that an object on the ground was a tank. In this view, being able to identify the presence of tanks in a given area, or their movement from one area to another, could be an important indicator of military developments.

The ability to spot a tank was the minimum level of resolution specified in the European Open Skies Treaty. In optical terms, this capability was set at one-meter resolution. The reason for the choice, however, was not that

the parties felt that it would provide an adequate level of information. Rather, this was the finest level of resolution that the former Soviet Union was then prepared to accept. The other parties decided to compromise on this limited capability as better than nothing. They believed at the time, however, that much finer degrees of resolution could provide important security information. In our view, a greater degree of resolution would also be beneficial to India and Pakistan.

If it were possible for both parties not simply to recognize a tank as such, but to differentiate between different models of tanks, armored personnel carriers (APCs), and artillery pieces, they would be in a much better position to ascertain the kinds of military units that were moving or deployed. Or if it were possible for both parties not simply to recognize an aircraft or a missile launcher as such, but to identify the type of aircraft or missile launcher, they would have a much more accurate understanding of the implications of the movement of aircraft or missiles, including both conventional and nuclear-capable systems. Since risk reduction depends on the quality of shared information, both parties would benefit from significantly better standards of resolution as a general proposition, perhaps to a level of a half or a few tenths of a meter.

At the same time, however, both parties might be concerned that beyond a certain point, high resolution photography could reveal important technological secrets. In addition, the parties might believe that such high levels of resolution would not be required to achieve generally agreed risk-reduction objectives. In this event, the parties might want to set a threshold level for highest degree of resolution permissible under the cooperative observation program. Where this point lies would be a matter for discussion between the parties. There is occasionally a fine line between the ability to distinguish between one piece of equipment and another—which is clearly important to risk reduction—and the ability to observe important technological innovations on those systems, which the parties might not want to expose to analysis. Some models of systems are very close to other models of the same system, and their distinguishing characteristics are only visible at very high degrees of resolution. These cases obviously would present difficult issues for decision by the parties. From a risk-reduction point of view, the safest approach would be to start with the requirements for identifying types of tanks, aircraft, artillery, missile launchers, and APCs, and then work backwards, depending on where and as necessary to protect sensitive technologies. The objective of such a process should be to ensure that both parties have the maximum possible ability to identify particular pieces and models of military equipment, and that this ability is not infringed except for genuinely overriding reasons of national or technological security.

Processing

As noted above, host country observation planes would have to be outfitted with dual cameras, so that each party could receive a set of the film negatives

immediately at the conclusion of the flight. If other sensors in addition to optical cameras were employed, these would also require dual recording systems. No information would be transmitted from the observation plane in real time during the flight. After the observation flight, the host country and the visiting country would each be separately responsible for developing and analyzing the set of negatives or other data that they had received from the flight. In the case of the visiting country, this would mean that processing would not begin until the visiting country observer team that had participated in the flight on the host country aircraft had returned home. Each party would be able to draw on preexisting photo interpretation capabilities.

The provision for dual sets of negatives or other data ensures that both parties would have the identical raw material regarding the area under observation. On the one hand, this could provide an essential basis for discussion should the visiting party wish to pose questions to the host party regarding something that was seen on the flight. On the other hand, it would serve as a protection for the host party against potential claims that something had been seen on a flight, which was not, in fact, there. As such, the existence of dual sets of material could work as an incentive for careful evaluation of the situation. As with the photographic equipment, third parties might wish to offer relevant processing equipment and training to both sides. It would even be possible to seek third party expertise in analyzing photographs. One way of doing this would be to have a single outside party—perhaps an agreed neutral international body—examine the photographs and provide identical reports to both sides. At present, this would appear to be out of step with the bilateral character of most successful Indo-Pakistani agreements, but it is one further option the countries could consider.

Dispute Resolution

No observation program anywhere in the world has ever functioned perfectly. It must be expected that there will be disputes and possible misunderstandings over the operation of even the best-designed program. If a camera malfunctions, parties could disagree as to whether sabotage were involved. If a flight is diverted because of weather, parties could disagree as to whether this was a necessary decision or an opportunistic means of avoiding observation. In looking at the pictures from a flight, one party might conclude that the other party had resorted to excessive camouflage in an effort to create a misleading impression of force deployments.

These and other potential misunderstandings could well arise during the operation of an agreement. However, because each occurrence would reflect unique circumstances, and because each party would necessarily have its own views of the situation, there can be no guaranteed formula for resolving disputes. Rather, the parties would have to agree that, in the event of disputes, they would devote their best efforts to remedying the particular problem and to ensuring that it does not happen again. The incentive to succeed in such

efforts would be the mutual interest in preserving the overall observation program. One way to facilitate consultations regarding the implementation of an agreement would be to establish a bilateral mechanism enabling the parties to raise and discuss questions as they occurred. Such a mechanism could defuse some potential problems at the technical level. At the same time, it would not infringe on the ability of the parties to draw their own independent conclusions from the operation of the cooperative observation program including, most importantly, their own conclusions regarding the security-related information provided by the program.

Misuse of Information

Some observers might fear that information gathered through cooperative aerial observation might be used to plan a disabling first strike. In such a scenario, observation flights would be used to pinpoint the location of certain high-value targets. Such targets would include, in particular, all elements of the respective national nuclear programs, nuclear-capable missile and aircraft delivery vehicles, and major ground force units. Both countries are likely to be very sensitive to this type of risk. However, they overcame very similar security concerns when they signed the agreement not to attack each other's nuclear installations and exchanged lists of the covered installations. In any event, the notion that it would be possible to pinpoint the location of any particular category of military equipment, even nuclear-capable delivery systems, greatly underestimates the complexities involved in the task. Since covering all potential sites within the national territory of the two parties would require separate observation flights over a period of weeks and months, neither country would be able to compile a truly comprehensive, up-to-date target set. This would be the case even if the parties were to agree to cooperative observation of their entire national territories. If the parties decided to provide for observation of relatively narrow border areas or some other limited area or list of sites the possibility of comprehensive coverage becomes even smaller. As noted previously, no country is going to undertake the risk of attempting a preemptive strike without far more certain knowledge than cooperative observation—or any other observation system—could provide. Even if an attack could be executed perfectly on all identified targets—which is improbable in the extreme as an operational matter—the costs of missing a single delivery vehicle because of an incomplete or out-of-date list would be catastrophic.

Similar considerations would apply to fears that information from cooperative observation might be used to orchestrate an attack on the conventional forces of the other party. In this case, while the consequences of missing an individual aircraft or ground force target would not be as severe, the sheer number of potential targets, and their ability to move before, during, and after any period of observation, means that the likelihood of successfully targeting any significant percentage of them using information derived from periodic cooperative observation is very small.

An Observation Timeline

Preparation for an observation mission could begin with one of the parties, which we will call the "visitor," preparing a flight plan covering sites in the territory of the other party, which we will call the "host." Once that plan was complete, the visitor would notify the host that it wished to have an observation flight conducted. In this initial notification, the visitor would identify the airfield in the host country from which the flight would depart. After a fixed interval following the notification, at most perhaps 24 hours, a group of four or five visiting observers would arrive at the host country's airfield from which the flight was to take place. This visiting party might arrive by land, if the airfield were close to the international border between India and Pakistan, or by air. In either case, the time and method of arrival would be agreed upon in advance between the parties.

Immediately upon arrival, the visiting party would present a copy of the flight plan to the host country's representatives. There would then be an agreed interval of a few hours, to give the host country time to notify its air traffic control system of the route of the flight and to prepare the observation aircraft and crew. In practice, this interval would also give the host country an opportunity to notify military installations and other sensitive facilities along the route of flight. Such advance notification could result in some sensitive equipment being moved under cover or some observable activities being postponed. It is unlikely, however, that either party would be able to use this short interval to hide major force movements. At the end of the interval, the observation flight would depart.

On board the host-country aircraft would be the host-country flight crew, a host-country observation team, and the visiting country observation team. Both observation teams could consist of four or five persons. During the course of the flight, the two observation teams would keep track of the route of the flight, checking it against the flight plan. The observation teams would also be responsible for ensuring that the photographic equipment was operating correctly and that pictures were being taken at the desired locations. Actual operation of the cameras would be automatic, in accordance with preprogrammed instructions provided by the visiting party.

Assuming there were no mechanical or other difficulties during the flight, the observation plane would return to its original base on conclusion of the flight. The total flying time could be several hours, depending on the distance covered and the speed of the aircraft. If necessary, in cases where a particularly long mission might encounter darkness before the observation flight was completed, the parties could arrange to schedule an interim overnight landing. Upon return to the original airfield, both the visiting and host parties would receive a set of negatives from the dual cameras on the plane. The visiting party would take its set of negatives and return directly to its country the same way it arrived. Both parties would then proceed to process the film in their own facilities. There would, however, be no agreed timeline for the processing operation. Nor would there need to be any

agreed timeline for the subsequent interpretation of the resulting photography. Each party could decide its own priorities for processing and interpretation, depending on its perception of the situation.

Once the photography had been analyzed, the visiting party would draw on that information to build its understanding of the current military situation. Again, there would be no prescribed or agreed timeline for the assessment process. If, for example, the photography indicated significant changes in the deployments of host-country military forces, the visiting country might decide to move rapidly to seek further clarification or to take offsetting steps of its own. Conversely, if the photography indicated no significant change in host-country positions from what had been observed on earlier occasions, the visiting country might conclude that there was no near-term need to alter its own dispositions or take other urgent action. In either case, the results of the photography would only be one input into the decision-making process of the visiting country. The timeliness and objectivity of that input, however, could be of great importance for the security of both parties.

Conclusion

Any program of cooperative aerial observation would require India and Pakistan to overcome major political challenges. The military establishments in both countries are accustomed to guarding information, not sharing it, and popular opinion has not been prepared for the change in philosophy inherent in a program of this sort. Putting a program in place would involve difficult negotiations. We believe, however, that there is sufficient flexibility inherent in the nature of such a program—including the prohibition of overflight of either party's territory by foreign aircraft, choices of areas of coverage, varying numbers of flights, and other factors—to meet the political and military needs of both sides.

Most importantly, a program of cooperative aerial observation would offer immediate, tangible security advantages for both sides. Some of these advantages are direct, for example, each country would acquire information for itself, thereby refining its own assessment of the situation. Other advantages are indirect, including the development of working relationships with counterparts and the chance to correct potentially dangerous misperceptions held by the other side. In combination, these advantages would provide the leaders of both countries a flexible tool to reduce the most serious threat to their national security, while strengthening their respective national capabilities to assess and control potentially dangerous developments.

Notes

1. An earlier version of this essay was originally published in W.P.S. Sidhu, Brian Cloughley, John H. Hawes, and Teresita Schaffer, *Nuclear Risk-Reduction Measures in Southern Asia*, report no. 26 (Washington, DC: The Henry L. Stimson Center, November 1998), 75–98.

2. For a discussion of these agreements, see Sumit Ganguly, "Mending Fences," in Michael Krepon and Amit Sevak, eds., *Crisis Prevention, Confidence Building, and Reconciliation Between India and Pakistan* (New York: St. Martin's Press, 1995), 12–13. Copies of these agreements are included in the appendix.
3. The shooting down in August 1999 of a Pakistani training aircraft, followed within a few days by Pakistan's firing at an Indian aircraft headed for the scene of the crash, demonstrated that neither side was observing the agreement to stay at least five kilometers from the border. A March 2002 incident involving an apparently accidental overflight of the Pakistani side of the LoC by an Indian military transport aircraft suggests that the agreement is still not being observed.

7

Risk-Reduction Measures in Kashmir

Brian Cloughley

Since India and Pakistan became independent in 1947, the former princely state of Kashmir has been a source of dispute between the two countries.[1] India and Pakistan first fought over possession of the region immediately after partition. In 1949, a United Nations (UN)-sponsored ceasefire left the state divided between them, but it was hoped that the two newly independent nations could reach agreement on its final status.[2]

Despite hopes that a solution to the problem would ensure peace in the region, there has been no settlement of the Kashmir dispute, and dissonance continues. With minor alterations, the temporary ceasefire Line established in 1949 has remained the unofficial northern frontier between the countries, and has become a source of frequent exchanges of fire from small arms, light weapons, and artillery of all calibers, with significant loss of life and damage to property. As early as 1950, the Australian jurist Sir Owen Dixon decried the "continued maintenance of two armies facing one another across a ceasefire Line," maintaining that "a danger to peace must exist while this state of things continues."[3] His warning was repeated in May 2002 by U.S. Assistant Secretary of State Christina Rocca who on a visit to Delhi said that "continued mobilization of two major armies facing each other in close proximity . . . could lead to an unintended conflict."[4]

In the period 1950–1958, Dixon was one of four UN interlocutors charged with assessing conditions for a peaceful and timely solution to the Kashmir conflict, and whose reports are still considered masterful.[5] Dixon's acute and agile mind was combined with elegant expression, and he, and authors of other official papers were conscious of the deep relevance the Kashmir dispute held for the political future of the South Asian region. In his final report, Dr. Frank P. Graham struck an apposite and resonant note in commenting that "some of the noblest spirits of our time are born of the spiritual heritage and democratic hopes of the peoples of the South Asian subcontinent," and was hopeful that there might be an "early settlement of the Kashmir dispute in the advancement of the cooperative progress of two great peoples and the peace of the world."[6] That hope remains to this day.

Since the 1949 ceasefire, India and Pakistan have fought two wars (in 1965 and 1971) and a brief "mini-war" in 1999 when Pakistani troops crossed the Line of Control (LoC) in northern Kashmir, but conflict in the region has thus far proved containable.[7] Beginning in 1989, however, violence in the Valley of Kashmir and nearby areas, terrorist acts by Kashmiri and non-Kashmiri militants, overreaction by security forces and questionable activities by irregular surrogates, fatal involvement of innocents in turbulence, and continuing disagreements among the major parties, have served to highlight the growing seriousness of the dispute.

The May 1998 nuclear tests by India and Pakistan gave an even more disturbing significance to clashes within the region, and in early 1999 Pakistan's illegal transgression of the LoC[8] in the Kargil sector was regarded by India as a deliberate attempt by Islamabad to heighten tension and "internationalize the Kashmir issue."[9] A meeting between Prime Minister A.B. Vajpayee and President Pervez Musharraf in Agra in mid-July 2001 failed to produce agreement on the Kashmir issue and, if anything, exacerbated discord between the nations concerning the major disagreement between them.[10] President Musharraf's "Address to the Nation" of January 12, 2002, was inflexible concerning Pakistan's stance on Kashmir and referred to "Indian occupation forces," although he was forthright in condemnation of terrorism, including in Kashmir, which sentiment was greeted warmly by U.S. Secretary of State Colin Powell.[11] Mr. Vajpayee's later statements on Kashmir have been similarly robust and uncompromising, and approaches by nations seeking to contribute to solution of the Kashmir question have been rejected by successive Indian governments.

The assault by terrorists of unknown provenance on the Indian Parliament complex in New Delhi on December 13, 2001, was regarded by India as direct involvement by Pakistan in India-centric terrorism. Delhi police stated that the terrorists were from the Lashkar-e-Taiba and the Jaish-e-Mohammad groups, both Pakistani-based militant organizations, and Indian deputy home minister I.D. Swamy, said on December 17 that, "Both these groups are ISI [Inter-Services Intelligence], Pakistan sponsored," and the Home Minister L.K. Advani, announced that, "The government is considering all options" including so-called "hot pursuit" in retaliation for the attacks.[12] Toward the end of December 2001 and in January 2002, India deployed some half-million troops, including formations moved from the extreme east of the country, and several squadrons of strike aircraft, all in operational configuration and readiness, close to the international border. The government refused to order withdrawal to peacetime locations until, as demanded by Defense Minister George Fernandes, Pakistan ceased "cross-border terrorism."[13] Pakistan reacted by placing its forces on a high state of alert, but forward movement was not undertaken on the scale of Indian redeployment, as most Pakistani-defended localities along the border are close to peacetime bases. The strength of the Pakistan army is 550,000, and that of India 1.1 million.[14]

Since May 1999, when India discovered Pakistani troops in occupation of tactically important heights some hundreds of meters on the Indian side of

the LoC in the Kargil area of Kashmir and a limited war began between the countries, the increase in tension and distrust between India and Pakistan has been palpable and disturbing. The nuclear and missile programs of both nations continue unabated, as stated by the Director of the Central Intelligence Agency (CIA), and there has been no intention to reduce weapons acquisitions—indeed the reverse, as India and Russia have evolved a complex and extensive series of cooperation projects, and Pakistan continues defense materiel cooperation with China. An outbreak of Hindu–Muslim inter-communal killings in the Indian State of Gujarat in early 2002 played a part in contributing to disharmony, as did increased militant activity in Kashmir.[15] Even were there to be military annihilation of extremist groups, it is far from certain there would be concurrent or resultant political accord concerning the region's status. Indeed, if India defeated the militants it is improbable the core disagreement between India and Pakistan concerning the way ahead on Kashmir would be solved, as India would be likely to emphasize its claim for sovereignty over the entire region, including the Pakistan- and Chinese-controlled areas, and Pakistan would not drop its affirmation that the Kashmiri peoples should be permitted an independently assessed plebiscite under UN supervision to determine their future. From this dismal picture of uncertainty and mistrust, it is apparent that the peace of the world may be more directly affected by the Kashmir problem in the era of a nuclearized Subcontinent than it was in the time of Sir Owen Dixon, Dr. Graham, and their colleagues.

Introduction of declared nuclear capabilities in South Asia emphasized the need to diminish or, preferably, erase tension before unmanageable escalation takes place. Nuclear risk-reduction measures (NRRMs) are especially relevant to Kashmir, given the imponderables and risks associated with manufacture, deployment, and operation of nuclear weapons. The absence of reliable command and control structures makes escalations in violence, increases in cross-border activity in Kashmir, or misreadings of the other side's intentions potentially far more dangerous. As one commentator wrote: "where America and the Soviet Union had elaborate safeguards against the sort of miscalculation that could trigger a nuclear exchange, Indian and Pakistani procedures are rudimentary and often ignored."[16] NRRMs are inextricably linked to the peaceful resolution of the Kashmir dispute and peace in Kashmir is inextricably linked to the absence of violence and infiltration along the LoC.

It was of disquieting significance that the overall commander of Indian troops in Jammu and Kashmir, Lt. Gen. R.K. Nanavatty said publicly in October 2001 that the capture of Pakistan-administered Kashmir was "achievable" and that, "The nuclearisation of the Subcontinent might have altered the situation, but despite that, the space exists for a limited conventional operation [against Pakistan-administered Kashmir]."[17] This, taken with President Musharraf's statement in February 2002 concerning possible use of nuclear weapons, continues to cause considerable international concern. In an interview for an Indian television channel, President Musharraf

declared, "I have said very clearly that nuclear power cannot be used, should not be used . . . However, when national integrity is threatened, then we will take a decision at that time." The reporter pressed him on the issue, saying: "You could use it in an Indo–Pakistan war and be the first to use it against the Indians?" General Musharraf replied: "We will take a decision when the occasion arises."[18]

The seriousness with which Indian and Pakistani nuclear developments are regarded by the United States (as an exemplar of general international concern) was indicated in testimony before the Senate Select Committee on Intelligence by CIA Director George Tenet on February 6, 2002, when he stated:

> Both India and Pakistan are working on the doctrine and tactics for more advanced nuclear weapons. . . . Although September 11 highlighted the challenges that India–Pakistan relations pose for U.S. policy, the attack on the Indian parliament on December 13 was even more destabilizing—resulting as it did in new calls for military action against Pakistan, and subsequent mobilization on both sides. The chance of war between these two nuclear-armed states is higher than at any point since 1971. If India were to conduct large scale offensive operations into Pakistani Kashmir, Pakistan might retaliate with strikes of its own. . . . Both India and Pakistan are publicly downplaying the risks of nuclear conflict in the current crisis. We are deeply concerned . . . that a conventional war—once begun—could escalate into a nuclear confrontation.[19]

There is an opportunity, however, for India and Pakistan to adopt measures in Kashmir that would have the initial effect of reducing tension, perhaps leading to conditions in which peaceful solution of the Kashmir problem could be negotiated without rancor, building on the accords reached at Simla in 1972 and Lahore in 1999. Accordingly, this essay describes the Kashmir region, covers the dynamics of insecurity along the LoC, and outlines the aims of NRRMs in Kashmir. It also discusses in detail specific NRRMs aimed at curtailing cross-LoC firing and infiltration, that could serve as a starting point for confidence building and cooperation between India and Pakistan.

Terrain and Military Forces

The area of the former princely state of Kashmir is 86,023 square miles,[20] or about the size of the Korean Peninsula, Kansas, or Great Britain. The territory is divided by a LoC established in 1972 following the 1971 conflict between India and Pakistan, replacing the former ceasefire line of 1949. India administers 53,665 square miles and Pakistan 32,358 square miles. The LoC stretches approximately 450 miles from grid reference NW 605 550, at the termination of the international border 35 miles west of Jammu, to NW 980 420 in the Karakoram Range 65 miles southeast of Mount K2 and 12 miles north of the Shyok River, the point being marked by a stone cairn.[21] There is no definition of the LoC from that point. Terrain varies from

flatland, hills, and semi-tropical growth in the south, through increasingly steeper areas and the temperate vegetation of the Pir Panjal Range (with occupied military positions up to 14,000 feet) until, north of the Jhelum River, which flows east to west through the LoC, the higher ranges begin. The west-east section of the LoC lies along and across mountain ridges, some over 18,000 feet, where any kind of movement is difficult and dangerous. It should be noted that a large region, Aksai Chin (approximately 14,000 square miles), claimed by India as part of Kashmir, is occupied by China, with whom border definition talks continued in 2002.

India and Pakistan maintain large armed forces in the areas under their administration. Along the LoC in "Azad" ("Free") Kashmir, administered by Pakistan, there are some 90,000 troops. Opposing them are about 190,000 Indian army soldiers in the Indian-administered state of Jammu and Kashmir.[22] Both sides can move large numbers of reinforcements to the area within hours.[23] There are no advanced fixed-wing combat aircraft (e.g., Pakistani F-16s or Indian MiG-27s) stationed in the region, but both countries have major airfields within a few minutes flying time (and Leh and Srinagar runways have been extended to take advanced combat aircraft). Similarly, armed helicopters are based within easy reach of the troops they would support in the event of conflict. There are large numbers of heavy weapons, from 81 mm mortars to 155 mm medium guns, many of which are positioned close to the LoC. The ground along the LoC is in general unsuitable for tanks, save for 50 miles at its southern extremity, near which several armored units are based. There are extensive anti-personnel minefields and wire obstacles in many areas.

Kashmir bristles with weaponry. The LoC is under constant patrol and surveillance by both sides. In some defended localities, opposing troops are literally within a stone's throw of each other, and cross-Line firing is common. Formal rules of engagement (RoE) exist and, although obviously unsatisfactory in terms of discouraging escalation from small arms fire to artillery exchanges, they may have contributed to avoiding further escalation into major conflict. The paucity of UN officers makes it difficult to assess the precise number of ceasefire violations.[24]

In no area on the Indian side are civilians permitted to move close to the LoC. Pakistan allows cultivation right up to the LoC on its side, and residents can move freely for wood gathering, control of livestock, water acquisition and travel.[25] Before escalation of violence in Indian-administered Kashmir in 1989, it was not uncommon for civilians to make their way across the Line for social gatherings (especially weddings involving members of families split by the LoC) and for the time-honored and generally harmless purpose of smuggling. Cross-LoC movement continues but is almost exclusively associated with the activities of militant organizations confronting Indian forces in Indian-administered Kashmir, although there have been instances in which parties of bewildered Bangladeshis, attempting to return home and fatally ignorant of geography, have been ambushed by Indian forces.[26]

CIVIL ADMINISTRATION

The civil authorities in both Azad Kashmir and Jammu and Kashmir play no part in military plans relevant to the LoC, these being the concerns of the army and the Ministry of Defense (MoD), and, to an unknown extent, civilian intelligence agencies. The military responsibilities of the territories' governments are confined to advice and cooperation on domestic matters, and, in Jammu and Kashmir, to liaison with the army on measures involved in combating insurgency. The Jammu and Kashmir Police Force contains an irregular element of unknown strength known as the Special Operations Group, which conducts covert operations.[27] The Government of India has stated that responsibility for law and order in some towns, including Srinagar, the summer administrative center of the region, has been returned to the civil police, but it is apparent that serious disturbances are dealt with by paramilitary or even regular troops.

Indian civil armed forces involved in anti-guerrilla operations include the Border Security Force and the Central Reserve Police Force, which are subordinate to the Home Ministry. Similar functions are performed by the Rashtriya Rifles under the MoD. Members of the Indo-Tibetan Police Force have been seen in the region. Paramilitary forces number around 300,000 in Jammu and Kashmir where they are under operational control (or command, in the case of the Rashtriya Rifles) of the Indian Army.

Elected assemblies govern the separate regions. Central governmental oversight for Pakistani-held portions of Kashmir is housed in the Ministry of State for Northern Areas, Frontier Regions and Kashmir Affairs. In May 1998, the Indian Minister of Home Affairs was "given charge of the Department of Jammu and Kashmir Affairs," which had hitherto been a separate entity.[28]

MILITANCY IN JAMMU AND KASHMIR

Since 1989 there has been a state of insurrection in Jammu and Kashmir.[29] Muslim militants seeking to gain independence, accession to Pakistan, or bilaterally recognized autonomy for Kashmir, have conducted a guerrilla campaign against Indian forces. India alleges that these groups are given aid and physical assistance, including weapons, by Pakistan. Pakistan denies this allegation, claiming that its activities are confined to moral and political support. India further claims that these militant groups include Afghans and other foreigners whose entry to Jammu and Kashmir can be only across the LoC.[30] There is evidence that foreigners are present in armed opposition groups, but it is not known in what strength.[31] In spite of claims that numbers of foreign militants operating in Kashmir have increased since initiation of U.S. operations in Afghanistan, there is no direct confirmation of this. There have been no independently confirmed reports of Afghan nationals being killed or captured.

By the Indian government's account, some 30,000 deaths have been caused in the region in the period from 1989 to early 2002, but Kashmiri separatists

claim that the number is closer to 80,000.[32] It is likely the figure is in between, but whatever it is, the number of killings is appalling. From January 1 to April 1, 2002, the *Indian Express* estimated that deaths in Indian-administered Kashmir were: Militants, 414; Security forces, 59; Civilians, 123 (men, 78; women, 23; children, 32).[33] It is regrettable that no independent agencies, be they Indian or international, are permitted official access to the Indian state of Jammu and Kashmir in order to determine the truth of allegations by militants, Indian authorities, local government officials, or Kashmiris themselves concerning the number and causes of deaths that have occurred in disputed or opaque circumstances. Some independent observers have succeeded in entering the region unofficially, and, together with carefully checked reports by inhabitants of Jammu and Kashmir, have contributed to production of a disturbing picture indicative of human rights abuses. Annual reports by Human Rights Watch and Amnesty International give details of many incidents in which there have been torture, extrajudicial executions, and murder.[34]

The long-term Indian goal in Kashmir is eradication of militant groups, as made clear by Home Minister Advani's statement in October 2001 that, "The proactive policy will continue, which means we will not be looking for terrorists to strike first . . . we will certainly go all out for them."[35] The army has no policy of seeking dialogue with militants, as its task is the conduct of neutralization operations, mainly by ambush along the LoC.[36] Human rights organizations have expressed disquiet about some occurrences and have questioned the commitment of the state and federal governments to address their concerns. One noted that "on August 8 [1997] the Jammu and Kashmir state government appointed a human rights commission to investigate complaints of abuse but gave it no jurisdiction over the army or other federal forces."[37] In Jammu and Kashmir there are pro-Indian government groups of irregulars whose numbers, remit, and operations are not divulged officially.[38] These groups appear to be composed of former guerrillas. Human Rights Watch has concluded that they are "organized, armed and protected by the Indian army" and that, "These state-sponsored paramilitary groups have committed serious human rights abuses, and human rights defenders and journalists have been among the principal victims." Human Rights Watch has recommended that "the government of India . . . disarm all state-sponsored militias not established and regulated by law. . . . "[39]

Pakistan's ISI Directorate monitors activities of guerrilla groups.[40] It is apparent that the line between supervision and support is a fine one, and it would be difficult to find anyone in India (or Pakistan) who believes that Pakistan, in the shape of the ISI, is not wholeheartedly—and physically—supporting the dissidents. Fueling speculation on this issue during the period of intensified cross-Line exchanges of fire in August 1998, then Pakistani foreign minister Gohar Ayub Khan stated that "the freedom movement in occupied Kashmir would have to be stepped up and Pakistan would have to give more political and diplomatic support to the freedom fighters."[41] Contrary to claims made by Pakistan at the time of the Kargil incursion in 1999, there were few if any militants involved.[42]

There are some 10 separatist groups operating in Jammu and Kashmir, of which only a handful have political credibility.[43] One aim of some of the dissidents is conveyed by the statement of the Jammu and Kashmir Liberation Front (JKLF) that:

> We believe that the Kashmiri people alone, or their representatives duly elected for this purpose, only have the right to decide about the future constitutional, political, social and economic system for the country and its relationship with foreign countries. Any decision forced upon the people of Jammu-Kashmir (by occupation forces) against their national aspirations will not be acceptable in any way. We believe that the best solution to the Issue is to reunify all parts of the forcibly divided State and offer full sovereignty and independence with a right to become a member of the United Nations. Our goal is to win freedom.[44]

Not all groups subscribe to this aim.

The All Parties Hurriyat Conference (APHC), a political combine of former militant groups, including members of the JKLF, that advocates a nonviolent campaign, seeks to speak with a single voice on its aspirations concerning a UN-supervised plebiscite to "choose a political future."[45] The APHC appears to speak for a number of elements, but some dissident movements decline central control and may not even be linked one with another. At least three main associations espouse accession to Pakistan and have a loose alliance with that objective in mind.[46]

It is difficult to determine the political objectives of some groups because their activities appear to be based solely on terrorism.[47] The inhabitants of Indian-administered Kashmir are increasingly targeted by gangs whose conduct has caused revulsion, but there are growing doubts as to the origins and motives of the perpetrators of some of the more outrageous acts. Some militants concentrate on their co-religionists, especially those who seek dialogue and compromise concerning the plight of the territory, and also on peace-minded, apolitical, and uncommitted members of the public whom they seek to influence against any move toward rapprochement.[48] Some groups receive support from organizations based in Pakistan, although President Musharraf has stated that he condemns terrorism "under any pretext, including Kashmir"[49] and that he aims to prevent support for any terrorist organization. The author visited representatives of a religious "charity" near Rawalpindi where it was made clear that assistance was given to Kashmiri groups, albeit, it was claimed, of a non-military kind.

In July 2000, the Hizbul Mujahideen (HM) guerrilla group imposed a unilateral ceasefire and stated it was prepared to talk with Indian authorities, but indecision on its part, and later imposition by HM of a requirement to accept Pakistan as a party to the talks, resulted in the truce ending on 8 August. There was movement on the part of Mr. Vajpayee to sound out the APHC concerning participation in state elections (and to that purpose he released some of its supporters from prison), but such is the complexity of Kashmiri politics and the reluctance of many of Mr. Vajpayee's supporters to

countenance any initiative they see as counter to India's sovereignty, that his well-meant intentions foundered.

India's unilateral ceasefire from November 19, 2000, initially intended to cover the month of Ramazan, was twice extended, and ceased on May 23, 2001. The ceasefire was at the initiative of Mr. Vajpayee, who said that he would "pursue this path [of engagement] by initiating talks with various groups in J&K." The *Economist* described the arrangement as an attempt to

> achieve a diplomatic breakthrough. Instead the violence that has claimed some 35,000 lives over the past 12 years continued, domestic criticism of the government's policy grew, and the risk—however slight—of the conflict escalating into a nuclear war with neighboring Pakistan remained.[50]

Nonetheless, Mr. Vajpayee offered to discuss Kashmir directly with the government of Pakistan—which was what led to the meeting at Agra in July 2001. Violence, however, increased in Jammu and Kashmir, and some militants announced that the "armed struggle" would be "accelerated."[51]

Militancy in Jammu and Kashmir has produced a significant diaspora of Kashmiri Pandit refugees (estimated to be some 350,000) who have fled the state, or, have been internally displaced. The costs to the government of supporting these refugees have been assessed at close to three billion rupees for the years 1989–1998. The authorities state that 16,977 houses have been vacated by these recent residents of the valley and its surrounding areas, together with 2,101 acres of land.[52] The creation and sustenance of refugees is a burden to the economy, and a cruel disruption to the lives of those concerned.

From the above it can be appreciated that the difficulties faced by India, Pakistan, and the peoples of Kashmir are immense. There is, however, an opportunity to open the way to trust and tranquility in the Subcontinent. The creation and sustenance of mutual credibility in order to pave the way to prosperity lies partly—perhaps mainly—in establishing sound, practical risk-reduction measures based and built on the fact that both nations wish, above all else, to live in harmony, no matter the violent ambitions of extremists on both sides.

Dynamics of Insecurity Along the Line of Control

The civil insurrection in Kashmir cannot be de-linked from military confrontation along the LoC, although these conflicts are separate manifestations of patterns of mistrust. The dangers to peace noted by Sir Owen Dixon in 1950 have not been constant. Since the creation of the ceasefire line in 1949, tension between India and Pakistan has fluctuated between quietude and violent conflict. Incidents of violence, however, have become considerably more common since the 1965 war, in which Kashmir was the basic cause of conflict between India and Pakistan.

In 1967, the two armies discussed and agreed to a series of confidence-building measures under the auspices of their governments and the good

offices of United Nations Military Observer Group in India and Pakistan (UNMOGIP). The provisions relevant to contemporary conditions are:

- Avoidance of misunderstandings concerning intentions by exchanging information about military exercises; and
- Preventing "avoidable incidents" through "local commanders resort[ing] to the agreed method of solving disputes/disagreement by holding joint meetings at various levels through the good offices of the UN Observers."[53]

Observance of these measures was interrupted by the 1971 war. Thereafter, mutual accords served to reduce tension considerably for the next 17, until the insurgency in the Kashmir Valley introduced violence of a new and different kind. Accordingly, as Robert Wirsing has noted, the number of clashes increased measurably "with the onset of the insurgency [in 1989]; and by late spring 1991, when [exchanges] began to include prolonged heavy mortar and artillery bombardments, so their ferocity [increased]."[54] Nevertheless, control could and can be exercised over LoC firing when desired. Heavy firing ceased almost entirely during the summer of 1992, signifying that higher direction had been given to this effect.[55] For six years after the pause in firing of 1992, incidents of firing across the LoC varied in number and type and, although serious, did not often reach the level of prolonged (six hours and over) or heavy (involving more than six artillery pieces) on either side.[56] Following the explosion of nuclear devices by India and Pakistan in May 1998, however, the number and level of exchanges of fire increased. U.S. ambassador to India, Richard Celeste, observed in mid-1998 that "there is firing almost daily on the LoC in Kashmir," giving rise to concern that the countries were "closer to a war than the Soviet Union and the United States ever were [during the Cold War]."[57] The aberration of the Kargil incursion by regular Pakistani troops in 1999 contributed to general growth in intensity of cross-LoC exchanges, but in mid-2001, when President Musharraf met with Prime Minister Vajpayee in Agra, there was distinct diminution in all types of firing, presumably because commanders on both sides were instructed to issue orders accordingly.

In the years before demonstration of overt nuclear capability, tension between India and Pakistan over the Kashmir situation could have (and on one occasion did, in 1965) become dangerous to the point of causing general hostilities. Some observers of South Asia have argued that more extensive exchanges of fire across the LoC might lead not only to wider conflict, but to a war involving nuclear weapons.[58] The former—and familiar—parameters of danger in Kashmir have been altered by introduction of the nuclear factor—and it appears that local commanders have more freedom to fire.[59] Further dangers exist. The North Atlantic Treaty Organization (NATO) and the Warsaw Pact evolved finely-tuned systems for the command and control of nuclear weapons over several decades—and even then, they were far from foolproof. India and Pakistan are in the nascent stages of such development.

Moreover, in Europe, NRRMs and command and control systems grew together symbiotically. In the Subcontinent, India and Pakistan cannot assess with confidence how far their neighbor can go before there may be pressing or even irresistible internal demands to threaten the use of nuclear weapons. Furthermore, it is not clear whether, as one commentator muses, Indian and Pakistani leaders "can avoid using Kashmir as a bargaining chip in domestic politics—and nuclear threats as a lever in Kashmir."[60] A paper published in May 2002 by the Center for the Advanced Study of India, written by Bruce Riedel, drawing on recollections of his period as special assistant to President Clinton,[61] describes possible nuclear preparations at the time of the Kargil crisis. Mr. Riedel provides insight to U.S. perceptions of the nuclear threat at the time, and states that the president asked the prime minister of Pakistan, Nawaz Sharif, if he knew "his military was preparing their nuclear-tipped missiles?" This is an intriguing revelation, although nuclear expert George Perkovitch and the Indian army chief of the time, General V.P. Malik, stated they doubted Pakistan had gone so far.[62] Nevertheless, opacity concerning nuclear intentions continues, exacerbating regional and international disquiet concerning the possible path of nuclear developments in the Subcontinent.

Common Ground for Risk-Reduction Measures

India and Pakistan disagree on a number of regional and bilateral issues pertaining to each country's respective security concerns. Intertwined with these concerns are deeper issues salient to each country's national identity, governance, domestic political culture, and military posture. There is room, however, for agreement between the two countries, based both on the 1972 Simla Accord, and on subsequent statements and policy positions on military and political issues. It is from these points of convergence that the two countries might begin to think about designing and implementing a range of NRRMs, contributing significantly to the establishment of a zone of peace and tranquillity in Kashmir, and serving wider objectives concerning bilateral understanding.

The Agreement on Bilateral Relations Between the Government of India and the Government of Pakistan[63] signed at Simla on July 2, 1972 ostensibly placed the countries on a path to reconciliation following their conflict of the previous year. It was intended that:

- . . . the two countries put an end to the conflict and confrontation that have hitherto marred their relations and work for the promotion of a friendly and harmonious relationship and the establishment of durable peace in the subcontinent
- In order to initiate the process of establishment of durable peace, both Governments agree [in the context of Kashmir] that:

(ii) . . . the Line of Control resulting from the ceasefire of December 17, 1971 shall be respected by both sides without prejudice to the recognized position of either side. Neither side shall seek to alter it unilaterally,

> irrespective of mutual differences and legal interpretations. Both sides further undertake to refrain from the threat or the use of force in violation of this Line.

India and Pakistan continue to aver that the Simla Accord should govern their relations. They differ, however, in their interpretation of the place of bilateralism in their negotiations. Attempts to resolve the dispute through dialogue have failed to achieve even modest advances towards harmony. Since India referred the dispute to the United Nations in January 1948, the two countries have met dozens of times to discuss the Kashmir problem.[64] These meetings usually result in a reiteration of each country's well-known stance. For example, Pakistan has proposed Indian troop withdrawals from the Valley without establishing that it would offer any meaningful *quid pro quo*.[65] Similarly, India accuses Pakistan of fostering cross-LoC movement by extremists, while making it clear that neutral observation of the LoC to discourage or assist in prevention of such activity—or, at least, to convincingly confirm or otherwise that it is taking place—should not be permitted.[66]

The meeting between prime ministers Vajpayee and Nawaz Sharif in Lahore in February 1999 appeared to herald a change in relations, but the effects of the Lahore Declaration[67] were negated by the Kargil incursion, which, almost without doubt, was being planned at the time.[68] The Declaration had as its first agreement that "respective Governments shall intensify their efforts to resolve all issues, including the issue of Jammu and Kashmir" which would have been a major step ahead. India, however, justifiably considers itself "betrayed" by the Kargil incursion's coincidence with the Lahore summit, with the Prime Minister having said that, "I had gone to Lahore with a message of goodwill, but in return we got Kargil."[69] Subsequently, there was an appearance of possible breakthrough at the meeting between Prime Minister Vajpayee and President Musharraf at Agra in mid-2001, but the sides could not agree on a final communiqué, although they came very close to it. Since then, although India's foreign minister Jaswant Singh said there was movement of "a caravan of peace," there has been backtracking concerning the desirability of negotiations.[70]

Maximalist claims over the state of Kashmir have made it impossible to construct an approach to conciliation without adopting an attitude—or creating an impression—that is almost certain to deflect the establishment of trust and the creation of an ambience through which progress can be made toward lasting rapprochement. These contradictions do not represent minor divergences of opinion; they are at the foundation of seemingly irreconcilable views that profoundly affect the countries' genuine desire to reduce tensions.

Both countries agree that firing across the LoC is undesirable. Each accuses the other of initiating incidents, however, and claims that returning fire is justifiable.[71] India has stated that Pakistani artillery shelling is used to cover infiltration or exfiltration of militants across the LoC, while Pakistan has stated that Indian fire is "indiscriminate." Neither claim, on its own, is

entirely convincing. It would be a poor commander who, if wishing to disguise clandestine movement, created an easily detectable pattern of activity. Similarly, "indiscriminate" fire is without value in military terms. Random and non-selective firing is undertaken only by unprofessional quasi-military elements, into which category neither the Pakistan nor Indian armies fall. As both countries deplore each other's firing across the LoC, this would seem to be common ground for construction of a medial position—with the confidence-building aim of preventing further exchanges of fire.

Another issue of contention concerns the international status of the LoC. In a letter to the UN Security Council in 1950, Sir Owen Dixon suggested turning the ceasefire line into the international boundary, arguing:

> The State of Jammu and Kashmir is not really a unit geographically, demographically or economically. It is an agglomeration of territories brought under the political power of one Maharaja. That is the unity it possesses. If as the result of an overall plebiscite the State as an entirety passed to India, there would be large movements of Muslims and another refugee problem would arise for Pakistan, which would be expected to receive them in very great numbers. If the result favored Pakistan, a refugee problem, although not of such dimensions, would arise for India, because of the movement of Hindus and Sikhs. Almost all this would be avoided by partition. . . . The difficulty in partitioning the State is to form a sound judgment where the Line should be drawn.[72]

India and Pakistan have so far refused to consider publicly proposals to turn the LoC into the international border.[73] As observed elsewhere, India contends that the area administered by Pakistan should be surrendered, while Pakistan states it wishes a plebiscite of all Kashmiris to decide their future.

It might be thought that the imperative of economic development would act as a spur to establishing a regime of trust, if only because the plight of the poor and underprivileged in the Subcontinent is such that any reduction in non-productive expenditure would be welcomed. There are few more debilitating or economically demanding pursuits than counterinsurgency warfare, or the manning of defended localities in a region in which infiltration is almost a daily event. The presence in Jammu and elsewhere of some 300,000 refugees from the Kashmir Valley is a significant budgetary strain. Nevertheless, economic considerations in both countries play but a minor part in determining policy concerning their mutual but dichotomous disquiet about Kashmir.

Another important common factor is the presence of a growing number of foreign guerrillas in the Kashmir Valley and its environs, a major source of the violence confronting India's security forces in the region. In April 2002, India's minister of state for external affairs said,

> We have credible information that nearly 3,000 to 4,000 militants, mainly comprising foreign mercenaries were awaiting infiltration into the Valley and higher reaches of Jammu to disrupt the democratic exercise [of forthcoming elections][74]

and Inspector General of Police K. Rajendra Kumar said that of the 270 militants shot dead by security forces between January 1 and March 31, 2002, most were foreigners. Pakistan denies that it provides military support to foreign militants (or any others). Both nations, aware of the necessity to alleviate some of their differences, agree that foreign-armed elements are undesirable and responsible for much of the tension in the region. They might also agree that these elements are detrimental to the welfare of the Kashmiri people on both sides of the LoC. These positions should serve as a starting point to a positive approach to confidence building.

It is beyond the scope of this essay to address the detailed positions of either government concerning the sovereignty of Kashmir. Nevertheless, neither country would claim that the present state of affairs, which contributes to wider and deeper suspicion of each other's motives and ambitions in the region, is in the best interests of the Subcontinent as a whole, or of the Kashmiri peoples in particular. Confidence building would have to be consistent with this perception if both countries intend to remove this primary irritant to bilateral relations—and it is this relationship, overall, whose equilibrium is of paramount importance to the long-term security of the Subcontinent and avoidance of escalation that could lead to nuclear war.

The matter of sovereignty in Kashmir is, and will remain, contentious. This discord, however, need neither deflect nor deter the governments from considering means of reducing tension and moving, in however measured a fashion, to establishment of trust. There is an opening available, albeit initially a narrow one, to the wider regions of mutually beneficial stability. Trust demands confidence and resolution: confidence that one's government is able to effect compromise, perhaps at the cost of temporary and even dramatic internal troubles; and resolution to go that extra mile in the cause of lasting peace that would benefit future generations. It is in the cause of stability, tranquility, and social development that NRRMs are advocated.

Core Objectives of Risk Reduction

Flowing from the desire of both India and Pakistan for a lasting peace in the Subcontinent, and observing the paramount importance of avoiding loss of lives as a consequence of the dispute in Kashmir, the core objectives of risk-reduction measures should be to:

- Minimize hostile activity along the LoC;
- Encourage and put in place a regimen through which impending escalation of minor conflict along the LoC can be contained;
- Create a "Zone of Peace and Tranquillity" in the region; and
- Lead to dialogue on the basis that "hostile nationalism" would be avoided and an approach to solution of the Kashmir problem be considered.

Risk-reduction measures would, therefore, be designed to reduce cross-LoC artillery firing and to create conditions in which firing can be eradicated

completely. Consistent with such measures would be the establishment of transparency concerning illegal passage across the LoC, which has contributed significantly to exchanges of fire. This objective could be accompanied by dialogue between local commanders in accordance with long-established confidence-building measures that have been permitted to fall into disuse. Additional measures would therefore include:

- Cooperation in mutually agreed surveillance of various types;
- Open Lines of communication between the sides (rather than hotlines, which, by definition, should be used only in emergencies);
- Redeployment consistent with the Simla Accord in order to reduce and, eventually, avoid employment of force as a first resort in solution of local or national differences; and
- Eradication of illegal LoC crossing, with associated monitoring capabilities.

Certainly, sovereignty claims are complex, but political intricacies need not preclude initiatives such as permitting passage of resident Kashmiris from one side to the other by a system of local registration and supervision. Trade would also benefit (albeit modestly in overall terms), in accordance with the stated objective of the South Asian Association for Regional Cooperation (SAARC) to establish a free trade area involving the entire Subcontinent. Together, the above proposals would contribute to reducing tension in the area of the LoC, leading to conditions in which progress could be made toward the creation of amicable trust along its length. Prime Minister A.B. Vajpayee expressed his commitment to these goals at the SAARC summit in Colombo in July 1998:

> We [the South Asian nations] represent great civilizations, ancient yet vibrant and alive, and yet we are amongst the poorest in the world. . . . Enough of sterile ideology. Enough of hostile nationalism. Enough of conflict on the basis of religion and creed. Enough of poverty and backwardness. Let us grow rich together.[75]

The Practicalities of Risk-Reduction Measures

Risk-reduction measures could be adopted to meliorate a tense and sensitive situation without infringing on the sovereignty of the nations involved, while adhering to the principles and purposes of the UN Charter in letter and spirit. The first major step would be to minimize hostile activity along the LoC. Illegal crossings routinely spark the exchange of small arms or artillery fire. The initiation of firing can lead to retaliation should there be sighting or other technical errors that cause rounds to impact away from the target on which they are directed. There may be other reasons for heavy-weapons engagements along the LoC, not the least being retaliation for casualties caused during exchanges of rifle or machinegun fire. Both sides state that such activity is unhelpful to engagement in dialogue and hold that the tenets

of the Simla Accord should guide their relations, in that their differences should be settled "by peaceful means."

It is therefore important that the causes of initiation of firing be minimized. This can be effected by:

- Publication of and adherence to verifiable RoE on both sides of the LoC. This effort would involve bilateral meetings to discuss practicalities and modalities concerning rules of engagement for light and heavy weapons. The meetings themselves would form part of the confidence-building process. Verification without involving UN Observers would be dependent on such procedures as radio and landline monitoring to establish precisely the course of events. Verification with UN observers would be preferable.
- Continuous scheduled and unscheduled visits to forward areas by national and foreign journalists, representatives of national and international human rights organizations, diplomats, defense attachés, and UN Military Observers.[76] These visits would foster general confidence that the sides were adhering to international norms concerning conflict avoidance. Administration of such activity would be the responsibility of the two armies under the guidance and central control of the appropriate area of government. There would be consultation between the sides to achieve cooperation in managing visits to the LoC and informing each other of impending activity. Respective "Visitors and Observers Bureaus" would be in direct and scheduled contact at an appropriate level by landline or any other means agreed by the participants. It is envisaged that the officers commanding these bureaus would have regular meetings.
- Reestablishment of regular flag meetings between military representatives of Pakistani and Indian forces along the LoC. These contacts would be, initially, at brigade commander level (one star), with the intention of arranging meetings at lower levels at increasingly shorter intervals. The final objective, to be attained within an agreed period (suggested as six months), would be to have daily meetings of company commander level at no fewer than two localities within each sector of the LoC.[77] The effect of these meetings would be to reduce tension at the level of "picquets" (minor defended localities).
- Daily use, staff officer to staff officer, of an open telephone link between mutually selected brigade headquarters on each side of the LoC.[78] The intention of this link is to encourage the exchange of courtesies and to avoid misunderstandings over local activity along the LoC. Maintenance of the landline link would be conducted by parties of signalers based in accommodations at the junction of respective sides' cables, thus encouraging further cooperation and trust.
- Installation of ground-based surveillance devices. These devices would detect illegal movement at a specified distance along the LoC.[79] The requirement is for a bilaterally operated (preferably neutrally supervised) set of devices placed at intervals along the LoC. These could include

activity sensors, ground radars and electronic barriers. A control center in each sector would monitor the devices and would have the remit to activate forces on whichever side of the LoC infiltration might be detected. RoE would dictate levels of counter-penetration reaction, which would require total cooperation between the two armies. Provision of the devices would be the responsibility of a mutually agreed third party, consistent with the terms of the Simla Accord.[80]

This last measure will be particularly difficult to negotiate and constitute. Technical, legal, administrative, and political problems can be expected. But to dismiss proposals for the installation of surveillance devices would be neither constructive nor in the spirit of the UN Charter. India states that infiltration across the LoC should cease. Pakistan states that it is not affording physical assistance to those who would seek to cross the LoC. On this basis of concord it would appear appropriate for the sides to investigate all means whereby peaceful resolution and confirmation of national claims might be achieved. A major benefit of establishing well publicized, high-technology bilateral surveillance would be the diminution—and possible cessation—of attempts to cross the LoC. Even were the countries to fail to agree on these measures, enhanced unilateral surveillance, possibly employing advanced systems provided by a third party on request, would go far in reducing the number of attempts at crossings.

The movement of reinforcements, relocation of artillery, visits by senior officers in helicopters—indeed virtually every aspect of activity along the LoC—can be detected by intelligence methods, day or night. The potential of such Open Skies information in the cause of peace is great but—for the moment, at least—unlikely to be countenanced by either government, given their urgent internal political imperatives.[81] The fact remains, however, that warning of major conflict in Kashmir will in all probability be obtained by third parties, and could serve to attract notice to the desirability of neutralizing provocation and reducing ferment.

Information concerning all of these initiatives could be placed on a Kashmir website, a joint Indo-Pakistan enterprise aimed at informing citizens of both countries and the world at large of the efforts being made to reconcile differences over Kashmir and to reduce tension. The emphasis would be on positive measures being taken to encourage rapprochement rather than on historical matters, in accordance with the nations' enunciated desire to avoid hostile propaganda.

Escalation Control Measures

The above measures could be regarded as a prelude to more substantive initiatives intended to contain or avoid escalation of conflict. To assist in the progression of confidence building, consideration could be given to means which would be not only consistent with the countries' desire to remain at

peace, but would also be comparatively simple to achieve and verify. These are suggested as:

- *Relocation of heavy weapons.* There is compelling evidence that a major cause of tension and escalation is the firing of major weapons (mainly mortars and artillery pieces) across the LoC.[82] Most of this equipment is located close to the LoC; some, indeed, with ranges of 15,000 meters and more, are positioned within five kilometers of the LoC. (There are mortar baseplates within a thousand meters.[83]) Heavy weapons are the catalysts of escalation. Were there heavy weapons positioned beyond the range of targets across the LoC, public safety and escalation control would be served. It would not be difficult for the professionals of the Indian and Pakistani armies' artillery arm to redeploy their equipment to achieve these aims. In essence, it would involve little *ab initio* effort, because both sides already have secondary gun areas to the rear of present locations, reconnoitered and surveyed, ready to accommodate guns or mortars should there be a tactical requirement to so place them. A 155 mm gun can fire up to the LoC from a range of 30 km, but it would not in every area be necessary or practicable to withdraw all of these pieces to such a distance due to problems concerning "crest clearance" and other arcane artillery technicalities. In short, redeploying military forces from positions likely to exacerbate political tensions can be achieved without major technical or tactical disruptions, should the Indian and Pakistani governments wish to do so.
- *Verification of procedures.* There would, of course, be a requirement to assure the other side that mortars and artillery pieces had been withdrawn to areas from which their bombs or shells could not impact across the LoC. Again, this is a comparatively simple procedure, as every weapon has a template that maps its maximum range.[84] The actual sites of relocated heavy weapons could be detected by high-resolution imagery provided by a third country (which would detect them, in any event), or by standoff reconnaissance by national air forces' reconnaissance aircraft, combined with other intelligence means.[85] Recent agreement by the United States to provide AN/TPQ-37 gun/mortar location radars to India [86] could be a step forward in this regard, as Pakistan already operates an earlier version (TPQ-36), which is only slightly less capable, and both can be used to detect within seconds of firing, the precise position of a mortar or artillery piece, with data being computer exchangeable, and thus independently verifiable. Both countries' radars are intended primarily for employment in areas to the south, but if the United States could make further units available (perhaps four each, in a subsidized Foreign Military Sales package) as part of an overall strategy to contribute to transparency and tension-reduction measures, it would be practicable to position them in fixed bases along the LoC and link their data collection accordingly, for verification purposes.
- *Reassurance of participants.* It would be necessary to make it clear, by bilateral agreement, that movement of equipment does not preclude their use in national defense measures. Thus, the original artillery or mortar

positions in forward areas would not be rendered physically unusable, and forward ammunition depots would remain intact. The two parties could design a regime for replacing or rotating ammunition, involving notification of ammunition convoys.[87] The very fact that such notification would be given, involving meetings and discussions, would of itself encourage trust and mutual esteem.

Relocating heavy weapons is an initiative that would most significantly diminish tension along the LoC. Civilian populations on both sides have been subjected to mortar bombing, shellfire, and general disruption and, by any tenets, this is inappropriate and undesirable. It is incumbent on both sides to restore normalcy to the lives of their citizens living close to this frontier. Removing artillery and mortars, the prime causes of death and destruction, would be a constructive initiative that would be welcomed not only by local inhabitants but by the world at large, which would see it as an encouraging indication of long-awaited cooperation.

Furthermore, restoring travel rights for Kashmiris in their eponymous region would be a marked step forward in encouraging the populace to regard India and Pakistan as being supportive of their wellbeing. It would not be impossible to design a system whereby residents of Kashmir could be permitted to travel across the LoC. The difficulties are immense, especially in ascertaining who might be considered a Kashmiri, issuing and controlling documentation, and devising mutually acceptable customs procedures, but in due course, consideration should be given to this important aspect of civil infrastructure and governance.

Conclusion

For over half a century, the story of Kashmir has been marked by vicissitudes, overhung by seemingly irreconcilable differences and grave misunderstanding, and stained by bloodshed. The dispute over Kashmir will not go away of its own accord, and its continued existence poses a barrier to reconciliation and a grave danger to peace in the Subcontinent. But it is not too late for India and Pakistan to embrace amity. There could be no better approach than to consider NRRMs in Kashmir designed to build trust and confidence and to reduce tension between countries in possession of nuclear weapons. These suggestions by no means exhaust the number of possible NRRMs, but given goodwill on both sides, they are practical and could be realized in the near future.

The fact that little progress has been made in the past to foster confidence or encourage trust along the LoC, or concerning Kashmir as a whole, is not altogether deleterious to future initiatives. Leaders of both nations are well aware that the Kashmir question cannot be ignored. There have been some efforts intended to cover general and specific confidence building. While it can be argued that more should have been done, it is important to note that existing postures are not immutable.

Dr. Frank Graham's final report on the Kashmiri dispute, written in 1958, still rings true:

> However wide the differences and deep the distrust, and however bad the situation in the opposite views of each other's position, no situation is completely and forever beyond the redemptive power of the development of reciprocal faith and the creative interchange of views and proposals for a peaceful settlement as alternatives to the deepening differences in an age of unprecedented peril and hope. Better than talking at long distances over the sub-continent is, on occasion, to talk directly to each other in a conference at the highest possible level. The holding of well-prepared direct talks with the desire for a settlement is more than talk: it is itself an act of potentially creative faith which might lead to steps for a fair and peaceful settlement.[88]

Dr. Graham's sagacity is shared by many in the Subcontinent. A new page in the story of Kashmir awaits inscription by those of goodwill who can look to the future with confidence untinged with bellicosity. This page awaits national leaders whose determination can transcend mundane and meretricious posturing.

NOTES

1. An earlier version of this essay was originally published in Michael Krepon and Michael Newbill, eds., *Nuclear Risk Reduction Measures in South Asia*, report no. 26 (Washington, DC: The Henry L. Stimson Center, November 1998), 1–24.
2. "Truce Terms transmitted to the Governments of India and Pakistan by the UN Commission for India and Pakistan," (S/AC.12/195, April 28, 1949), established a ceasefire line "based on the factual positions occupied on January 1, 1949, by the forces under the control of the Indian and Pakistani High Command." In K. Sarwar Hasan, ed., *The Kashmir Question*, Documents on the Foreign Relations of Pakistan (Karachi: Pakistan Institute of International Affairs, 1966), 215.
3. United Nations Security Council, "Report of Sir Owen Dixon, United Nations Representative for India and Pakistan, to the Security Council," General S/1791, incorporating S/1791/Add.1 (September 15, 1950). See H.S. Gururaj Rao, *Legal Aspects of the Kashmir Problem* (Bombay: Asia Publishing House, 1967), Appendix XXII, and Hasan, *The Kashmir Question*, 249–79.
4. "India, Pak Dangerously Close to War: US," *Times of India* (May 15, 2002), Internet: http://timesofindia.indiatimes.com/articleshow.asp?art_ID=9953217.
5. See *Reports on Kashmir by UN Representatives* (Karachi: Government of Pakistan, 1962). In chronological order these were General A.G.L. McNaughton (Canada), Sir Owen Dixon (Australia), Dr. Frank Graham (United States), and Mr. Gunnar Jarring (Sweden). Dr. Graham submitted the final report in the series, dated (March 31, 1958).
6. Ibid., 85. The sentiments expressed were in the context of the death of the Pakistani prime minister Liaquat Ali Khan at the hand of an assassin.
7. There was fighting in Kashmir in 1971, but the dispute was not itself the cause of war. See Šumit Ganguly, *The Origins of War in South Asia* (Boulder, CO: Westview Press, 1994), and Richard Sisson and Leo E. Rose, *War and Succession: Pakistan, India, and the Creation of Bangladesh* (Berkeley: University of California Press, 1990) for discussions of the 1971 War.

8. In the Kargil sector. The Line of Control dividing Kashmir into areas administered by India and Pakistan was adapted from the original Cease Fire Line (CFL) following the 1971 war; see next.
9. Kargil Committee, *Executive Summary of the Kargil Committee Report*, 13, Internet: http://alfa.nic.in/rs/general/25indi1.htm. The Kargil Report is covered in more detail in the section "The Dynamics of Insecurity Along the Line of Control."
10. See, for example, "From the Host Himself: Guest Took Us for a Ride," Sanjiv Sinha, *Indian Express* (July 20, 2001), Internet: www.indian-express.com/ie20010720/top1.shtml.
11. The full text of President Musharraf's speech is at www.pak.gov.pk/public/President_address.htm, and Mr. Powell's endorsement at www.usinfo.state.gov/topical/pol/terror/02011304.htm. But see also "The General's Broken Promise," *Washington Post* (May 15, 2002), A26.
12. *Reuters* (December 17, 2001); also "Pullout of Forces Not Possible: Delhi," the *Hindu* (India) (May 15, 2002), Internet: http://www.hinduonnet.com/thehindu/2002/05/15/stories/2002051502990100.htm.
13. "India Sees No Letup in Terrorism, to Remain on War Alert on Pakistan Border," *Associated Press* (April 15, 2002).
14. The International Institute for Strategic Studies, *The Military Balance 2001–2002* (Oxford: Oxford University Press, October 2001).
15. Scott Baldauf, "As Spring Arrives, Kashmir Braces for Fresh Fighting," *Christian Science Monitor* (April 9, 2002), Internet: http://www.csmonitor. com/2002/0409/p07s02-wosc.html; "Suspected Islamic Militants Storm Indian Army Camp," *Reuters* (May 14, 2002).
16. "India and Pakistan: Can They Arrange a Cold War?" the *Economist* (UK) (October 3, 1998), 102.
17. Binoo Joshi, "India Sends War Warning to Pakistan," *Associated Press-New York* (October 31, 2001).
18. "Musharraf's Nuclear Warning to India," *BBC World Service* (February 7, 2000), Internet: http://news.bbc.co.uk/hi/english/world/south_asia/newsid_634000/634659.stm.
19. George J. Tenet, "Worldwide Threat—Converging Dangers in a Post 9/11 World," Testimony before the Senate Select Committee on Intelligence (February 6, 2002), Internet: http://www.odci.gov/cia/public_affairs/speeches/dci_speech_02062002.html. See also "Agni-II Induction Boosts N-Credibility," the *Hindustan Times* (India) (April 25, 2002), Internet: www.hindustantimes.com/nonfram/260402/detNAT19.asp.
20. There are conflicting figures (e.g., 84,471 square miles, given in Alan J. Day, ed., *Border and Territorial Disputes*, 2nd Edition (Harlow, UK: Longman Group, 1987). These and other area data are taken from Alastair Lamb, *Kashmir, a Disputed Legacy* (Oxford: Oxford University Press, 1992), 14–15. Lamb indicates that India revised the figure in 1961 to 86,023, "because of the official inclusion in India of the Aksai Chin."
21. See "Delineation of the Line of Control in Jammu and Kashmir Resulting from the Ceasefire of December 17, 1971, in accordance with the Simla Agreement of 2 July 1972," signed by representatives of the two armies on December 11, 1972. The text of the Simla Accord is available at http://www.indianembassy.org/policy/Kashmir/shimla.htm.

22. Use of these terms does not imply acceptance or otherwise of claims made by India or Pakistan concerning the territory of Kashmir. The countries also refer to "Pakistan Occupied Kashmir" or "POK" and its concomitant, "IOK." It is common in Pakistan to hear "held Kashmir" as meaning Indian-administered Kashmir.
23. India has a further 300,000 paramilitary troops in and around the Kashmir Valley, most involved in internal security duties. One such element, the Border Security Force (see below), assists the regular army in manning positions along the LoC. Troop figures are obviously contentious, and estimates vary. The author visited both areas of Kashmir in 2000, as a guest of both governments, and has subsequently consulted private sources to ascertain trends in troop strengths. The numbers in this essay are an independent assessment.
24. The UN Military Observer group in India and Pakistan (UNMOGIP) has 44 military officers of whom half are available at any one time to investigate violations of the ceasefire. Investigations are carried out only on the Pakistani side of the LoC. For an authoritative study of UNMOGIP, see Pauline Dawson, *The Peacekeepers of Kashmir: The UN Military Observer Group in India and Pakistan* (London: Hurst & Company, 1994). Also see Robert G. Wirsing, *India, Pakistan and the Kashmir Dispute* (New York: St. Martin's Press, 1994), 68–75.
25. Observation by the author.
26. For example: "Indian Force Shoots Dead 12 Bangladeshis in Kashmir," *PTI* report in the People's Daily (Bangladesh) (December 6, 2000), Internet: http://english.peopledaily.com.cn/200012/06/print20001206_57112.html.
27. See Amnesty International: "The general climate of impunity in Jammu and Kashmir may be seen both as facilitating and encouraging further violations of human rights by security forces and police in the state," AI-index: ASA 20/023/2001 (April 23, 2001). Also Human Rights Watch, *World Report 2002: Asia: India*, Internet: www.hrw.org/wr2k2/asia6.html.
28. "Advani Given Charge of J&K Affairs," *Times of India* (May 24, 1998).
29. For a good account of the insurgency, see Victoria Schofield, *Kashmir in Conflict* (London/New York: IB Tauris, 2000); Manoj Joshi, *The Lost Rebellion: Kashmir in the Nineties* (New Delhi: Penguin India, 1999), is informative but partisan; Robert G. Wirsing, *India, Pakistan and the Kashmir Dispute* (New York: Palgrave, 1997), chapter 4, is another dispassionate source.
30. See such news items as "11 Killed in Kashmir," *International Herald Tribune* (March 4, 2002): "Officers said Indian security forces had shot and killed three 'foreign' militants in Rajouri district southwest of Srinagar . . . " All news concerning provenance of militants and claimed numbers killed emanate from official Indian sources. There is little independent reportage of events in Indian-administered Kashmir, as entry to and movement in the region are strictly controlled.
31. Lt. Gen. Krishan Pal, Commander 15 Corps, HQ Srinagar, stated on September 14, 1998, that the "number of militants operating in the Valley would not be over 1,000 and the foreign elements among them is 60 to 70 per cent" in "Militancy Waning in Jammu and Kashmir," the *Hindu* (India) (September 15, 1998). The General added that "the number of foreign militants will increase." The author had a personal briefing from General Pal's successor, General John Mukherjee, in April 2000, and was provided evidence indicating that the number of foreign militants killed by his forces was in the approximate ratio of 2 : 3 with "Kashmiris." This cannot be other than a rough guide to the scale of involvement of foreigners, given such imponderables as training standards (i.e.,

do foreign militants survive longer because they are better-trained?), and availability of safe havens (do Kashmiris survive longer because they are more welcome in their countryfolk's houses and thus less liable to betrayal?). It is possible, in May 2002, that the ratio of foreign militants to native-Kashmiris is about 3:2, given an estimated total strength of 2,500.

32. See, for example, "Fifteen Killed in Rebel Violence in Indian Kashmir," *Reuters* (April 22, 2002).
33. The *Indian Express* maintains a web page on Kashmir: http://www.expressindia.com/kashmir/. These totals do not include the numbers killed in a major terrorist attack on an Indian army camp near Jammu on May 14, 2002.
34. Human Rights Watch/Asia, "India," in *World Report 2001*, Internet: http://www.hrw.org/wr2k1/asia/india.html. See also *Amnesty International Report 2001*, Internet: http://www.web.amnesty.org/web/ar2001.nsf/webasacountries/INDIA?OpenDocument.
35. Myra MacDonald, "India Vows to Get Tough with Pakistan over Kashmir," *Reuters* (October 19, 2001).
36. See Indian Army website maintained by HQ XV Corps (Srinagar) at http://www.armyinkashmir.org
37. Human Rights Watch/Asia, "India."
38. See "Rights Violations in Kashmir Alleged," the *Hindu* (India) (June 4, 2001), Internet: http://www.hinduonnet.com/thehindu/2001/06/04/stories/0204000d.htm.
39. Human Rights Watch, *India's Secret Army in Kashmir: New Patterns of Abuse Emerge in the Conflict*, Human Rights Watch Country Report (New York: Human Rights Watch, 1996), 2. Also *HRW Report 2001* at http://www.hrw.org/reports/1999/kashmir/back.htm.
40. India states categorically that Pakistan is fully supportive of militant organizations. Indian External Affairs Minister Jaswant Singh, stated on May 14, 2002, that "Their [terrorist groups'] leadership is not freed. It lives in houses and gets paid an allowance by the government of Pakistan." the *Times of India*, Internet: http://timesofindia.com/articleshow.asp?art_id=9881544.
41. "Gohar Fears War with India," *Dawn* (Pakistan) (August 3, 1998).
42. See Schofield, *Kashmir in Conflict*, 206–16. Also Brian Cloughley, *A History of the Pakistan Army*, 2nd Edition, (Oxford: Oxford University Press, 2000), 375–92.
43. "The governor [of Indian-administered Kashmir, G.C. Saxena] placed the number of Local militants at 1,000. Only three outfits—*Hizbul Muzahideen, Lashkar-e-Toiba and Harkat-ul-Ansar*—were active now." Inder Sawhney, "J&K Foresees No Threat From Taliban," the *Times of India* (September 9, 1998). Most militant groups are small and many have been ephemeral. See Indian army website www.armyinkashmir.org/artcles/killed.html for an official assessment of guerrilla groups' strengths.
44. JKLF Mission Statement at http://www.geocities.com/jklf-kashmir/jklfmission.html.
45. Mehmood Ahmad Sagar, *All Parties Hurriet Conference Jammu and Kashmir, A Profile* (Muzaffarabad, Azad Jammu and Kashmir: APHC, May 7, 1994). See Alexander Evans' website for organization of the APHC: http://www.kashmir-group.freeserve.co.uk/APHC%20Organizational%20Structure.htm.
46. Political loyalties are not always firm. One band, the Ikhwan ul-Musalmeen, having at one time favored accession, declared allegiance to India in 1995 and has since acted in support of the security forces against other militant groups.

47. Human Rights Watch, *India's Secret Army in Kashmir*, chapter 7.
48. "[L]ast month saw the emergence of a previously unheard-of separatist group here [Srinagar] called the *Taliban-i-Kashmir*, which warned Muslim women to start wearing veils by 10 September or face 'action.'" "Taliban Making its Presence Felt in Kashmir," *AFP* in the *Nation* (Pakistan) (September 10, 1998). See also *Amnesty International Report 2001.* It appears nothing has been heard of this group since 1998, and its provenance is suspect.
49. U.S. Department of State, "Powell Praises President Musharraf's Speech Against Terrorism," US Department of State Media Release (January 12, 2001), Internet: http://usinfo.state.gov/topical/pol/terror/02011304.htm.
50. "Back to the Drawing Board," The *Economist* (UK) (May 23, 2001).
51. "Kashmir Death Toll Mounts Despite India Summit," *Reuters* (July 16, 2001); also "Militants Vow to Step Up Kashmir Armed Struggle," *Reuters* (July 17, 2001), and "More Than 1000 Killed in Kashmir Despite Ceasefire," *AFP* (May 23, 2001).
52. "J&K Govt Under Pressure to Hike Relief for Migrants," the *Hindu* (India) (September 3, 1998). In mid-1998, the U.S. dollar would buy 42 rupees at the official rate of exchange (50 rupees to the dollar in 2002). Pandits are high-caste Hindus, but the term is sometimes used to denote Kashmiri Hindus of any caste. (Prime Minister Jawaharlal Nehru came from Kashmiri Pandit stock.) No more up-to-date figures were available from the Government of India in 2002, as the refugee situation had not altered markedly.
53. United Nations, "Extracts from Record of Discussions held between Commander-in-Chief Pakistan Army and Chief of Army Staff, India," *UN Observers Manual*, Amendment 20 (1969), Annex F to chapter 1, 1. Other sections dealt with adjustments to the Line, the flight of light aircraft in the region, and the evacuation of defended Localities or "picquets" by both sides. CBMs concerning high-level military contact, exercises, and air movement have been translated into wider agreements so far as the international border between India and Pakistan is concerned. For a discussion of these agreements, see Šumit Ganguly, "Mending Fences," in Krepon, ed., *Crisis Prevention, Confidence Building, and Reconciliation in South Asia* (New York: St. Martin's Press, 1995), 11–24 and Sony Devabhaktuni and Matthew C. J. Rudolph, "Key Developments in the Indo-Pak CBM Process," in Michael Krepon, Khurshid Khoja, Michael Newbill and Jenny S. Drezin, eds., *A Global Survey of Confidence-Building Measures* (New York: St. Martin's Press, 1999).
54. Wirsing, *India, Pakistan and the Kashmir Dispute*, 150.
55. Ibid., 151. It cannot be claimed that local commanders or even their military superiors can initiate major exchanges of fire involving heavy weapons. Were that so, it would indicate that the armed forces of both sides were permitted to move events independently of their governments, or that control over the military had broken down. Neither is the case, and both countries would reject any such presumption.
56. Personal information. There were incidents in which more serious engagements took place. These may have been caused by specific interpretations of circumstances by one side or the other, leading to escalating exchanges that ceased after a day or so, on occasion by mutual arrangement.
57. "Indo–Pak Tension Beats Cold War: Celeste," *Indian Express* (August 1, 1998).
58. See George J. Tenet, "Worldwide Threat-Converging Dangers in a Post 9/11 World," Testimony of Director of Central Intelligence (February 6, 2002),

Internet: http://www.odci.gov/cia/public_affairs/speeches/dci_speech_0206 2002.html.

59. Lt. Gen. Krishan Pal in interview, "Militancy Waning." Pal asserts: "The ground situation [in Kashmir] has changed in the wake of nuclear tests by India and Pakistan."
60. "India and Pakistan: Can They Arrange a Cold War?" the *Economist* (UK) (October 3, 1998), 102.
61. Bruce Riedel, "American Diplomacy and the 1999 Kargil Summit at Blair House," Policy Paper Series 2002 (Philadelphia: Center for the Advanced Study of India, University of Pennsylvania, May 2002), Internet: http://www.sas.upenn.edu/casi.
62. Howard W. French and Celia W. Dugger, "US India–Pakistan Mission Fails to Ease the Standoff," the *New York Times* (May 16, 2002), Internet: http://www.nytimes.com/2002/05/16/international/asia/16STAN.html. George Perkovich is a Senior Associate at the Carnegie Endowment for International Peace and author of, *inter alia*, the magisterial *India's Nuclear Bomb: The Impact on Global Proliferation* (Berkeley: University of California Press, 1999).
63. Simla Agreement (July 3, 1972), Internet: http://www.indianembassy.org/policy/Kashmir/shimla.htm.
64. "Letter of the Representative of India Addressed to the President of the Security Council, 1 January 1948," (S/628) in Hasan, *The Kashmir Question*, 107.
65. John Chalmers, "Dialogue of the Deaf Raises Stakes on Subcontinent," *Reuters* (August 1, 1998).
66. Prime Minister A.B. Vajpayee has stated "Let me say this loud and clear: there is no place for any third party involvement in this process [of dialogue concerning Kashmir]," as cited in "India Rejects Mandela's Call on J&K," the *Times of India* (September 4, 1998).
67. The Lahore Declaration (February 21, 1999), Internet: http://www.indianembassy.org/South_Asia/Pakistan/lahoredeclaration.html.
68. The writer was informed by an impeccable source that movement of ammunition and personnel by the Pakistan army to forward areas in the north took place in March.
69. "Vajpayee Wants Meeting of Hearts with Musharraf," *Dawn* (Pakistan) (February 4, 2002); also "POKs Return Not a Precondition, Says PM," the *Times of India* (February 24, 2002), in which Prime Minister Vajpayee is reported as saying that President Musharraf was "talking through his hat" concerning Kashmir.
70. Brian Cloughley, "Talking with Mr Vajpayee," the *Daily Times* (Pakistan) (April 11, 2002), Internet: http://www.dailytimes.com.pk/default.asp?page=story_11-4-2002_pg3_2.
71. See for example: "India says Pakistani Fire Kills Soldier in Kashmir," *Reuters* (March 26, 2002); also "Pakistan Says India Firing Kills Woman in Kashmir," *Reuters* (April 11, 2002).
72. "Report of Sir Owen Dixon," in Hasan, *The Kashmir Question*, 277.
73. Privately, many Indian and Pakistani officials concede or even contend that turning the LoC into the *de jure* international boundary is the only practical solution to the Kashmir dispute. A formal proposal would, however, be faced with significant constitutional and political difficulties in India.
74. "Militants Ready for Inflitration: Omar," the *Times of India* (April 22, 2002), Internet: www.timesofindia.indiatimes.com/artcleshow.asp?art_id=7693396

and "Rebels Waiting to Cross into Indian Kashmir—Police," *Reuters* (April 7, 2002).

75. John F. Burns, "At South Asia Summit: an Annual Economic Lament," *New York Times* (August 3, 1998).
76. "Scheduled" visits could be by prior arrangement for travel to a particular sector at a mutually agreed time and date. "Unscheduled" visits would be permitted at shorter notice and would take place within a defined period of days, but at an unspecified time.
77. Each side's sectors do not have matching boundaries but are known in detail by one another. It would be a simple matter to reach agreement concerning in which company areas meetings should be arranged.
78. The senior staff officer in a brigade HQ is usually the "Brigade Major" who is (or should be) too busy to be tied down to a regular arrangement such as this. It is important that the nominated officer be of the same rank on both sides and that in the absence of one, an officer of equal rank be notified in advance to the other side.
79. Both armies have such equipment in place for their own particular purposes, but it would be inappropriate to dwell on their technical specifications, deployment, or efficacy.
80. "...[T]he two countries are resolved to settle their differences by peaceful means through bilateral negotiations *or by any other peaceful means mutually agreed upon between them*." (Emphasis added), The Simla Agreement (July 3, 1972).
81. See John H. Hawes and Teresita C. Schaffer, "Risk Reduction in South Asia: A Role for Cooperative Aerial Observation?" Chapter 6.
82. There have been instances of anti-tank weapons being fired, but the main cause of tension escalation is the use of indirect fire weapons—artillery and mortars—whose locations are not within line of sight of their targets. They fire at targets chosen by result of reconnaissance or that are "acquired" (identified and located) by observers in positions close to the area to be fired upon.
83. Indicative ranges of mortars are: 81 mm (Pakistan)/82 mm (India)—3 km; 120 mm (both)—5–6 km; 160 mm (India)—10 km. The range of a 105 mm gun is about 15 km, depending on type.
84. There are such things as "non-standard conditions"— meteorology, rotation of the earth, ammunition characteristics, and so forth—that can alter the range of a gun by perhaps a few hundred meters at particular times. These would be taken into account by technical experts.
85. See Hawes and Schaffer, "Risk Reduction in South Asia: A Role for Cooperative Aerial Observation?"
86. "India buys U.S. radar in landmark deal," *Times of India* (April 18, 2002), Internet: http://timesofindia.indiatimes.com/Articleshow.asp?art_id= 7250583.
87. Vehicles carrying ammunition are readily identifiable from various "signatures."
88. "The Graham Report" (March 1958), *Reports on Kashmir*, 283.

8

Nuclear Risk-Reduction Centers

Rafi uz Zaman Khan

The underlying sources of tension between India and Pakistan remain unresolved. A severe crisis could lead to military conflict, and any conflict has the potential to escalate.[1] With the nuclearization of South Asia, the prospect of such escalation assumes horrific significance, since conflict remains unpredictable and may not necessarily remain at the conventional level. The concepts of "limited war" and "preemption" are fraught with danger and may not be applicable in South Asia.

The Kashmir dispute remains the *raison d'etre* for hostility between India and Pakistan. Having fought three conventional wars and one limited war in the past, the level of animosity remains high. Bilateral efforts, in the form of various confidence-building measures (CBMs) and nuclear risk reduction measures (NRRMs), have not ushered in a lasting peace to South Asia. These measures have failed due to the absence of trust, strong political will to resolve the Kashmir dispute, and dispute resolution mechanisms, monitoring, and enforcement. The presence of nuclear weapons makes a military solution to the Kashmir dispute unlikely. The longer India and Pakistan remain estranged, the more distrust builds and the more both sides expect the worst from each other. Conditions for stable deterrence are absent, and an accident or miscalculation during a crisis has become increasingly possible. As both nations struggle to adapt to the "stability–instability paradox,"[2] should they be left alone at the nuclear brink?

There is ample evidence of the need for concrete arrangements to build trust and prevent misperceptions. In addition to steps to resolve the Kashmir dispute—without which confidence-building or nuclear risk reduction measures are unlikely to succeed—it is imperative for India and Pakistan to establish nuclear risk reduction centers (NRRCs).

NRRCs should be dedicated for official communication and the rapid exchange of relevant information. They can be used as a central message center for all CBM and NRRM notifications. The proper utilization of NRRCs could prevent unintended signals from leading to a crisis or inadvertent nuclear escalation. The centers may also facilitate the identification, negotiation, and implementation of additional institutional and procedural arrangements, as well as technical measures intended to reduce nuclear risks.

NRRCs could provide the means of instantaneous communication among technical experts in the event of a tragic incident or unusual event. While taking concurrent measures for conflict resolution at the political level, both countries could immediately negotiate measures to establish NRRCs, which would symbolize the commitment of the two governments to responsible nuclear stewardship. NRRCs may not only help consolidate measures for the implementation of existing CBMs and NRRMs, they may also help build the trust and confidence that is essential to conflict resolution. Functioning under an already negotiated, preformatted system to exchange notifications, the NRRCs would not involve any kind of voice communication for crisis resolution, which might transmit misleading or unintended signals. By design, the NRRCs would not substitute for political or diplomatic means of communication.

The Need for Nuclear Threat-Reduction Centers

Existing confidence-building measures and nuclear risk reduction measures have failed to achieve their desired objectives because they lack verification and enforcement mechanisms, and because they are disconnected from dispute resolution. As Michael Krepon has observed, India and Pakistan have used CBMs more as "competition-building measures than as confidence-building measures."[3] "Most of the CBM proposals," he argues, "have instead been designed to capture the political high ground, not to solve problems."[4] "The juridical status of CBMs as 'politically binding'—rather than legally binding—documents helps afford India and Pakistan the latitude to skirt proper implementation."[5]

During critical periods of heightened tensions between India and Pakistan, CBMs have been either ineffective or absent. Michael Krepon describes the three stages of the CBM process as "conflict avoidance measures, confidence building measures and strengthening the peace."[6] Pakistan and India have not yet moved beyond the first stage of the CBM process. Dr. Maleeha Lodhi notes

> . . . CBMs cannot stand-alone and can only work in a broader context. The presumption of priority for CBMs is that underlying problems are not resolvable, and therefore, by freezing the status quo, CBMs can somehow reduce tension and avert the danger of war . . . . Meant to be a step towards conflict resolution, they can often be used as a substitute. They have frequently been pursued in South Asia under external prodding or pressure and at the expense of problem solving.[7]

Bilateral initiatives in the absence of conflict resolution are not effective in South Asia. Substantive dialogue on the resolution of Kashmir is necessary for progress to be achieved on other fronts.[8] Until positive measures for conflict resolution and new initiatives for the prevention of escalation and nuclear risk reduction are negotiated and implemented, nuclear risk reduction in South Asia will remain elusive.

Since the Kashmir issue may take several years to resolve, the establishment of NRRCs should not be delayed until a settlement is reached. The successful functioning of the NRRCs depends, however, on concurrent measures toward a resolution of the Kashmir dispute. The creation and proper function of NRRCs could help create a "virtuous circle" of building bilateral trust and confidence. If the people of India, Pakistan, and Kashmir are convinced of the sincerity of governments and reassured by the progress of their dialogue on Kashmir, dangerous practices and the conviction for armed struggle are likely to wane.

Objectives of Nuclear Risk-Reduction Centers

The concept of a nuclear risk reduction center originated in a working group organized by Senators Sam Nunn and John Warner. The U.S. Nuclear Risk Reduction Center is a unique government entity located in and staffed by the State Department. The U.S. NRRC and its Russian (then Soviet) counterpart were formally established at a signing ceremony in Washington, DC on September 15, 1987.

Although used primarily for the exchange of notifications under existing bilateral and multilateral treaties, the NRRC has periodically proved its use in other areas as well. In January 1991, "goodwill" notifications were used to exchange information on the reentry of the Salyut 7 space station. Later that same year the NRRCs served as a means of emergency communications during a major fire in the U.S. Embassy in Moscow. In the last 14 years, 11 such "goodwill" messages have been exchanged.

From the first message sent in April 1988, the NRRC has served as a dependable means of exchanging information. It is integral to arms control treaty implementation, and meets communications requirements for almost 20 arms control treaties and agreements with over 50 countries in 6 different languages. Presently, 153 different types of notifications are being exchanged annually in accordance with various treaties.[9]

The purposes behind the establishment of NRRCs during the Cold War were as follows:

- To facilitate negotiation and implementation of additional institutional and procedural arrangements, as well as technical measures intended to reduce nuclear risks;
- To create a buffer around nuclear risk-prevention measures and to protect them from the vicissitudes of U.S.–Soviet relations;
- To provide more latitude to national leaders during crises;
- To provide a means of instantaneous communications among technical experts in the event of unusual contingencies;
- To provide a mechanism for training skilled interagency crisis teams;
- To reassure the publics in both nations, and in third countries, that the two great powers were acting to reduce the risk of nuclear war.[10]

These objectives are also pertinent to the establishment of NRRCs in India and Pakistan. Three broad purposes might be served in a South Asian context:

(1) To serve as a central clearinghouse for data exchanges and notifications of existing agreements and to formalize the provision of information in a transparent manner.
(2) To help institutionalize and foster proper implementation of unilateral, bilateral, or multilateral measures for nuclear risk reduction, arms control, and/or force reduction in the region.
(3) To build trust and confidence by providing data that could assist monitoring and compliance as well as to nullify misperceptions.

The establishment of NRRCs between India and Pakistan could similarly be utilized to exchange official communications. They could also be used to prevent unintended escalation. The NRRCs would be used for advance notifications of strategic exercises and military training maneuvers. Though exchanging information on the exact location of their nuclear missiles or storage sites may not be in the security interest of the two countries, the NRRC could greatly aid in the implementation of future arms control and force reduction measures.

The existing hotline between the directors general of military operations (DGMOs), the heads of states, and other diplomatic channels of communication would continue to function as they have their own specific military, political, and diplomatic roles. The NRRCs, under a director general, senior diplomat or political figure with sufficient experience in handling security issues, directly appointed by the head of state, would coordinate with all relevant military, intelligence, and diplomatic circles to perform its functions for the timely exchange of accurate information and notifications under various agreements. The NRRCs may thus become the nodal point for the coordinated exchange of information.

NRRCs in Pakistan and India could be used to send goodwill messages. They could also be utilized to help resolve and respond to questions of clarification of data provided. The NRRCs could become an appropriate official channel for the exchange of information during crises to alleviate concerns and prevent misunderstandings.

The governments of India and Pakistan would be expected to provide adequate resources for the operation of the NRRCs. The NRRCs executive would seek guidance and technical assistance from his government and intelligence agencies. He would also have direct communication and access to the foreign minister, the president, and prime minister.

Agreed procedural arrangements between the NRRCs could be particularly valuable during crises. The manning of the NRRCs, as well as intra- and inter-governmental coordination during crises, could help. If the staffs of the respective NRRCs have developed good working relations during peacetime, they would be more likely to communicate effectively during crises.

By exchanging preliminary information and assessments of mutual intentions and implementing procedural arrangements, the NRRCs may prove more successful than hotlines have in the past.

Troop movements, military exercises, and intelligence-gathering systems are means of sending important signals. However, it has been difficult to convey intended messages with precision, and some messages may be misinterpreted. The messages transmitted or conveyed may appear to be muted or overdrawn and could be entirely misinterpreted by the other side. The establishment of NRRCs could help rapid exchange of detailed and accurate messages. During periods of deep crisis, the NRRCs could collect information that would help to evaluate and analyze data and to assist political leaders in deciding to take a specific course of action.

Instantaneous means of communication among technical experts could be very useful during air and naval operations. The shooting of Pakistan's naval aircraft "Atlantic" by India and similar incidents could have been prevented if NRRCs were in place and if they had been functioning properly. Exchanges between the NRRCs would be helpful following accidents.

The NRRCs would be staffed by a selective group of interagency experts and technically skilled personnel. The goal would be to train skilled interagency crisis prevention teams. The negotiations for establishing the NRRCs would include coordination procedures during periods of quiet and for crises. There should be regular meetings and consultations between the staffs of the NRRCs. The need for cooperation is particularly important for defusing potential crises involving nuclear terrorism. The interactions between the multidisciplinary NRRC staff would have great potential to handle situations the moment crises arise. Given a well-developed understanding of each other's concerns, prior planning, analysis, and training to handle such incidents, NRRCs would not only help to defuse crises, but may also be a step forward toward cooperation for joint action to fight nuclear terrorism.

The establishment of NRRCs would help clear the clouds of mistrust and reduce the chances of conflict and a crossing of the nuclear threshold. Trust and confidence could be built by consolidating notification measures of existing and future CBMs and NRRMs and by making these notifications legally binding. By creating an institutional framework for notifications, it would be easier to monitor compliance, especially if consultative mechanisms are established regarding obligations to notify the other side. Dispute and conflict resolution would become more likely, from a basis of increased trust and confidence. However, the establishment and successful functioning of the NRRCs depends upon concurrent measures taken for conflict resolution regarding the Kashmir dispute. But the process to negotiate, establish, or activate NRRCs should not be delayed until a resolution of the Kashmir issue, which could take considerable time given its own internal dynamics and complexity. However, positive measures taken to resolve the dispute through a sustained dialogue would serve as an impetus to operate the NRRCs effectively. In the absence of conflict resolution, NRRMs will fall short.

RISKS AND APPREHENSIONS

The utility of establishing NRRCs between the United States and the Soviet Union was questioned by some analysts, as will be the creation of NRRCs between India and Pakistan. There were four principal concerns associated with NRRCs raised during the Cold War:

- The creation of centers could increase Soviet opportunities for spreading misleading information and deception leading up to and during crises;
- The centers could offer opportunities for the Soviets to gain important and sensitive intelligence information;
- By providing an additional channel of communication, the creation of the centers could lead to confusion and mixed signals;
- The creation of the centers could prompt concerns by allies, friends, or third parties that Washington and Moscow would discuss problems in which they had a stake without adequately considering their interests.[11]

The first three arguments listed above are equally applicable to Indo-Pakistani relations.

- *An opponent's use of the NRRC for transmitting misleading, deceptive, or false information.* The NRRCs are designed to serve as a separate, additional channel of official communication among technical experts. They would follow agreed procedures and specific methods of exchanging notifications and information. In the prevailing security environment, the interest of both countries to resolve a particular crisis may well override their conflicting positions on larger disputes. In some situations, however, the NRRCs might be used to convey misleading or false information, further exacerbating tension in an already strained political environment. A decision to misuse this official channel for nuclear risk reduction would clarify the opponent's dubious intentions. The damage resulting from an opponent's misuse of the NRRC would be directly proportional to the intelligence and capabilities of the other side to identify false or misleading information. The staff of the NRRC could be trained to identify the disinformation techniques, allowing them to advise senior government officials and political leaders when the information received through the NRRC channel appears to be disingenuous or misleading. National intelligence agencies are also trained to identify misinformation. Thus, the staff of the NRRCs could add to such capabilities. With or without the NRRCs, there are no guarantees against providing misleading or false information. The establishment and proper staffing of NRRCs can help clarify the quality of information provided, while encouraging proper implementation of agreements reached.
- *Threat to national security.* The establishment of NRRCs in South Asia would not change nuclear deterrence or doctrine. Their creation would be designed to prevent misperceptions of intentions or unintended escalation.

Further, there was no perceptible change in the nuclear strategies of the United States or Russia following the establishment of their NRRCs. Nor is there any evidence that the NRRCs in Washington and Moscow have revealed sensitive information. Likewise, authorities in India and Pakistan would have exclusive powers to decide which information the NRRC may communicate. The NRRCs would be staffed with a highly trained coterie of multidisciplinary personnel with considerable technical experience to handle the security and strategic environments of South Asia. Moreover, the information exchanged would be previously agreed upon and conveyed under a pre-formatted system. Intelligence agency officials may be asked to provide guidance as deemed necessary. The functioning of the NRRCs would therefore guard against unauthorized disclosure of potentially sensitive or damaging information.

- *The NRRCs may not prevent crises or nuclear terrorism.* True. But crises and acts of nuclear terrorism could also occur in the absence of NRRCs. If these events occur, the NRRCs could help avoid unintended escalation. The quick exchange of information in such situations could lead to cooperation on nuclear safety measures to prevent and control nuclear radiation that could result from an accident or as a result of an attack on a nuclear installation. Both India and Pakistan might be willing to cooperate in such situations, instead of acting in ways that could lead to conventional conflict and a crossing of the nuclear threshold. Non-government experts are already in the process of addressing this issue.[12]

Operational Issues

- Key staff members from both centers will meet once or twice a year to resolve problems and to seek improvements in the efficiency of the centers.
- The staff will not exchange any voice or telephone communications, because of the potential this mode of communication has for misperception. The centers shall exchange only written and preformatted notifications, the text and details of which shall be mutually decided and agreed upon by both countries during their meetings.
- "Goodwill" messages may be used only in cases of an emergency to prevent a potential crisis. No deviations will be accepted in this regard. The United States and Russia have exchanged only 11 "goodwill" messages in the last 14 years.
- Messages must be sent via preformatted and agreed upon templates. The multidisciplinary staff must use its skill to identify any anomalous notification and prevent its recurrence.
- The staff must always rapidly submit notification to their counterparts and effect prior coordination with various departments accordingly. In case of any delay or lapse, the notification should still be forwarded with regrets on the failure to retain trust and confidence in the institution.

It must be noted that the "NRRCs are not the panacea for crisis management" and should not become involved in substantive negotiations during crises. Crisis management is the job of trained diplomats and the burden will continue to fall on political leaders. The "NRRCs could compliment diplomatic channels during crises only when political authorities believe that technical exchanges about military activities could be useful supplements to the main diplomatic discourse."[13]

The nuclear risk-reduction centers would be established in Islamabad and New Delhi and would remain open continuously. During any event with the potential to cause a nuclear crisis, they should be manned around the clock. These centers could be equipped with the latest computers and hotlines with high-speed data facsimile transmission links as agreed by the two governments. Duplicate devices should be installed to assure reliable technical means of communication, even when one system malfunctions. Both countries could acquire separate channels on the same or different satellites to further ensure redundancy. Ciphers would enhance the communication security between the two countries. A group of diplomatic, military, and intelligence personnel along with a few civil and technical experts would be required to work in the NRRC on both a temporary and permanent basis.

The staff should operate under previously agreed upon instructions. The president or prime minister, as considered appropriate, may nominate the director general of the NRRC who would report to the president or prime minister's national security adviser or to the foreign minister. He could be a civilian with prior experience in security negotiations. The proposed organization for Pakistan's NRRC and a suggested diagram for its technical equipment are depicted in Figures 8.1 and 8.2 respectively.

A group of inspectors or observers, consisting of technical personnel only, might be associated with the NRRCs. This group of inspectors or observers would provide a "verification element" of the notifications provided to the NRRCs, thereby building trust and confidence in the information exchanged. For example, if notifications of large-scale military exercises were sent through the NRRCs, inspectors or observers could be sent to confirm the information provided. At least initially, observation might be confined to

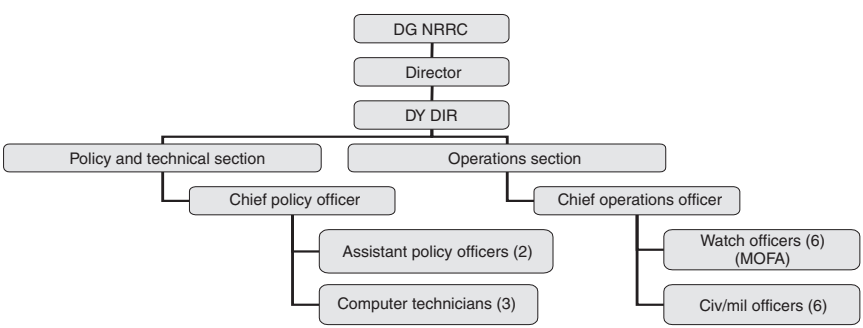
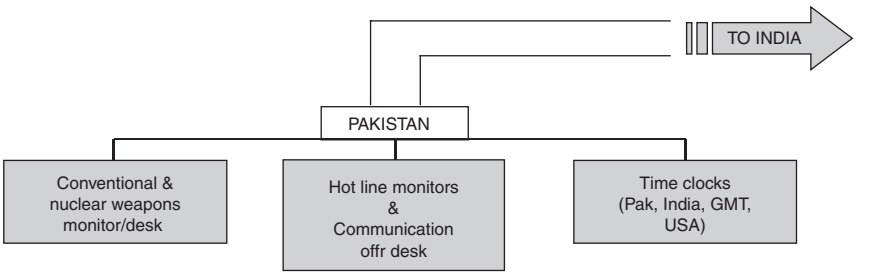


Figure 8.1 Pakistan's NRRC suggested organization



– Double monitor and receiver systems for redundancy.
– Initially a single separate channel could be used by either country through one or two different commercial satellites as appropriate. However, for communication security, cyphers may need to be exchanged mutually to prevent interception by any other country.
– DG NRRC may have direct priority links with the following:-

– Secretary MOFA	– Secretary NSC/Security Advisor to President	– DG Operations (Army, Navy, AF)
– Secretary MOD	– DG SPD	– DG ISI

Figure 8.2 Proposed communication and equipment security diagram

activities—such as large-scale military exercises—that do not involve nuclear forces. Observation and assistance to civil authorities during national emergencies could also be undertaken. Once the element of verification has gained acceptance and confidence has been built, the two sides could consider mutual observation of more sensitive activities. Detailed procedures for observation could be the subject of negotiations. The list of the visiting inspectors of the other country would be processed by the government and intelligence agencies to verify their credentials, including the pilots by the civil aviation authorities to accord the necessary clearances.

The NRRC staff may be required to perform a wide range of functions in peacetime as well as during periods of tension and crisis. Despite the development of standard operating procedures, the centers may not initially be able to perform all the functions of the U.S. and Russian NRRCs. Pakistan and India could begin modestly with task-oriented functions acceptable to the two governments. Once underway, additional functions could be worked out at a later date. The establishment of NRRCs would no doubt face certain hurdles, but through political will and concerted efforts they can be surmounted. Annual or semiannual meetings between the staff are essential to enhance the scope and functioning of the NRRCs. U.S. technical support and practical advice in this regard would be critical. U.S. NRRC officials and nongovernmental experts were all optimistic about the merits of NRRCs for South Asia and were willing to render necessary assistance in the light of their experiences.[14]

LOCATION OF PAKISTAN'S NRRC

Both the staff and inspection elements of the Russian NRRC are functioning quite smoothly in the Ministry of Defense. The U.S. debate on the issue

in 1986 considered four locations: the NSC apparatus at the White House, the Department of Defense, the Department of State, and a new setting separate from existing bureaucratic institutions.[15] However, then Secretary of State George Shultz's argument prevailed. He argued that since the new channel of communication was being created as an additional link between the two governments and that such communication is overseen by the State Department, the NRRC should function under the direct support and direction of the U.S. Department of State.[16] The U.S. on-site inspection expertise, however, functions under the Pentagon. Bureaucratic hurdles and vested interests were reportedly cited as reasons for preventing their integration.

Pakistan could decide either to keep the NRRC under the principal secretary or national security adviser to the president or prime minister or under the foreign minister. The General Headquarters has its own hotline channel and reports to the Ministry of Defense. Therefore, the NRRC could work as a separate channel exclusively under civilian control. Military-related information and notification could be sent to NRRCs by routing through their official channels and the Ministry of Foreign Affairs or External Affairs as applicable to both countries.

Conclusion

The proposal for creating NRRCs could help the security environment in South Asia. The creation of NRRCs needs to be an agenda item for dialogue between Pakistan and India. NRRCs should be negotiated and properly implemented promptly without waiting for the outcome of the Kashmir dispute. The NRRCs would help to consolidate and enhance the scope of current CBMs and NRRMs between the two countries. The monitoring of certain notifications could facilitate trust and conflict resolution.

Notes

1. The views expressed in this paper are those of the author and do not necessarily represent the policy viewpoints or opinion of the Government of Pakistan, the Pakistan Army, or the Strategic Plans Division.
2. See Michael Krepon and Chris Gagné, eds., *The Stability–Instability Paradox: Nuclear Weapons and Brinksmanship in South Asia* (Washington, DC: The Henry L. Stimson Center, June 2001).
3. Krepon et al., *Global Confidence Building: New Tools for Troubled Regions* (New York: Palgrave, 2000), 178.
4. *Ibid*., 183.
5. *Ibid*., 176.
6. Michael Krepon, "Conflict Avoidance, Confidence Building and Peacemaking" in *A Handbook of Confidence Building Measures for Regional Security*, 3rd ed. (Washington, DC: The Henry L. Stimson Center, 1998), 2.
7. Dr Maleeha Lodhi, "Nuclear Risk Reduction and Conflict Resolution in South Asia," the *News* (Islamabad), November 28, 1998.
8. Mr. Inam ul Haq, former foreign secretary of Pakistan, in a statement at the Conference on Disarmament at Geneva on January 25, 2001 has proffered a

three-tiered comprehensive peace and security framework that includes simultaneous conflict resolution dialogue, a regional strategic restraint regime, and regional cooperation in economic, trade and social revival between the two neighbors. See Feroz Hassan Khan, "Navigating the Crossroads", the *Monitor* Center for International Trade and Security, University of Georgia vol. 7, no. 3 (Fall 2001), 10–14.

9. Barry M. Blechman and Michael Krepon, *Nuclear Risk Reduction Centers* (Washington, DC: Center for Strategic and International Studies, 1986), 1–26, *Brochure on The U.S. NRRC: 1988–2002* (Washington, DC: Department of State, 2002), and author's interviews with NRRC Director Harold Kowalski, Jr. and NRRC staff (August 22, 2002).
10. Barry M. Blechman and Krepon, *Nuclear Risk Reduction Centers*, 6–8.
11. Ibid.
12. Rajesh Basrur and Hasan Askari Rizvi, "Nuclear Terrorism in South Asia" (Washington, DC: Presented at the Brookings Institution, September 13, 2002).
13. Blechman and Krepon, *Nuclear Risk Reduction Centers*, 12–13.
14. Interview with U.S. NRRC Director Harold Kowalski, Jr., August 22, 2002.
15. Blechman and Krepon, *Nuclear Risk Reduction Centers*, 22–25.
16. Interviews with NRRC director and staff, August 22, 2002.

This page intentionally left blank

III

Missile Defense and Regional Stability

This page intentionally left blank

9

Missile Defense: An Indian Perspective

Rajesh M. Basrur

On May 1, 2001, President George W. Bush announced a strategic initiative that sought to effect a radical break with the past by supplementing offensive capability with missile defense as the centerpiece of American national security strategy.[1] The Government of India reacted with remarkable alacrity in shedding its earlier doubts and expressing its warm appreciation of the President's speech. The response surprised almost everyone, partly because it was a significant departure from the Government's misgivings about American proposals for a national missile defense (NMD), and partly because of the rapidity with which it came. The public debate that followed was conducted with the vigor displayed earlier over important national security decisions on the Comprehensive Test Ban Treaty (CTBT) and over the nuclear tests of May 1998. In fact, the debate was a little late in coming. NMD had entered the U.S. strategic agenda much earlier during the Clinton Administration, but Indians gave it little attention at the time. Besides, India's own interest in missile defense goes back several years. While much (though not all) of the current global attention has focused on the U.S. NMD, Indian interest has for several years revolved around developments relating to missile defense in its own strategic context. Both kinds of missile defense are relevant to India's national security, but in different ways. The U.S. NMD has an indirect bearing on Indian security, while a more limited missile defense has a direct one.

In this essay, I attempt to gauge the appropriate posture that India should take with respect to both kinds of missile defense. The issue is an evolving and open-ended one. Will the U.S. NMD be "robust" or limited? How will the United States attempt to shape Russian and Chinese reactions, and how will they actually react? What they, and China in particular, will do may have a bearing on the strategic posture of India and, in turn, Pakistan, though here again there is no certainty as to how either will respond. Equally, how will the United States deploy Theater Missile Defense (TMD)? Will Taiwan be a recipient and, if so, how will China respond? Will India incorporate some form of missile defense into its defense apparatus, and, if it does, what

will Pakistan do about it? I raise these questions because I find the participants in the discourse tend to display little nuance and often speak with a certainty that does not rest on a careful consideration of the range of possibilities. In particular, there is scarcely any thoroughgoing argument for or against missile defense based on an adequate discussion of its relation to the fundamentals of deterrence.

To start with, the concept of missile defense needs some clarification. In the American strategic lexicon, NMD is generally understood as a response to the threat posed to the U.S. homeland by long-range missiles, while TMD is aimed at countering theater missile threats to U.S. interests overseas. The definition needs flexibility. For instance, if the continental United States were to be attacked by a ship-borne short-range missile, the appropriate defense would be from a so-called TMD system. In short, a TMD system may well play a role in NMD. This is particularly true of India, which faces threats to its homeland from short-range and intermediate-range missiles. Thus, the Indian interest in anti-missile defensive systems is aimed at a limited *national* defense even though the specific systems may be designated as TMD systems in the United States and elsewhere. The distinction is further blurred by the fact that military and civilian targets overlap extensively: most cantonments and nuclear facilities are adjacent to urban centers. To avoid confusion, I will simply use the term "missile defense" in the Indian context.

Here, I first examine the official Indian response to the Bush initiative and explain the reasons for India's shift from doubtful distancing to politically astute applause. I next analyze in some detail the response of the Indian strategic community to the Government of India's position. Thereafter, I present a case for supporting NMD on basic doctrinal grounds. I then extend the line of reasoning and argue in favor of a limited Indian missile defense for the purpose of protecting Indian assets.

India's Official Response to Missile Defense

Much has been made of the remarkable shift in India's attitude toward the Bush initiative of May 2001. In fact, earlier criticism of the American interest in NMD had been perfunctory and, considering India's own interest in TMD, contradictory as well. In early July 2000, Defense Minister George Fernandes, when questioned about NMD, said that "the US should give up this whole exercise as it will lead to far too many problems than [*sic*] we can visualize now."[2] Less than a week later, Fernandes was ambivalent. While expressing some concern that American NMD might alter the global nuclear balance and start a new arms race, he also noted that it would dismantle "mutual assured destruction" (MAD) and, more importantly, would not affect India's nuclear program.[3] Similarly, External Affairs Minister Jaswant Singh observed that India was against the militarization of outer space, but expressed his satisfaction with the talks he had held with his counterpart, Madeleine Albright, and her deputy, Strobe Talbott.[4] The cursory interest displayed by senior members of the Indian cabinet may have been due to

India's "reluctance to contradict its number one trading partner, its number one source of direct investment and technology, and its number one potential ally in its rivalry with China and Pakistan."[5] But it certainly was not the result of a lack of interest in missile defense as an issue. As shown here, Indian interest in missile defense dated back several years, though the main focus was—and still is—on TMD. Hence, it is hardly surprising that, while expressing some reservations, India never took a strongly critical position on NMD.

Nevertheless, the Vajpayee government's warm reaction to Bush's May 2001 speech was unexpected. The Ministry of External Affairs, in an official statement, applauded the President's effort to dismantle the "adversarial legacy of the Cold War" and his desire to "make a clean break from the past" by "stepping away from a world that is held hostage by the doctrine of MAD."[6] After the initial surprise, some commentators took a second look at the Indian position and discovered nuances. Nicholas Berry pointed out that India had not endorsed NMD at all, but had only expressed enthusiasm for the portion of the Bush speech that underlined arms control.[7] The point was expressly conveyed by Indian officials to senior Russian and Chinese leaders, though not to the satisfaction of either.[8] Indian policy makers, caught between the United States on one hand and Russia and China on the other, had to engage in a fair bit of tightrope walking. The inducement held out by the Russians—transfer of missile defense technology (space-tracking radar and anti-tactical ballistic missile (ATBM) rockets) in addition to other military hardware—was considerable.[9] Still, as a senior Russian journalist admitted, winning India over to the Russian point of view had "proven difficult."[10] At a joint press conference with the visiting Russian Foreign Minister, Igor Ivanov, just three days after the Bush speech, Singh called on the United States not to abrogate the ABM Treaty unilaterally, but to "engage Russia in dialogue," which was a fair distance from saying that the preservation of the Treaty was a serious concern to India.[11] Singh also explicitly welcomed the Bush initiative, declaring that "[b]etween mutually agreed decisions and mutually assured destruction, the former is preferable."[12]

Notwithstanding the careful choice of words, the fact remains that, taken as a whole, India's response to the Bush speech was very supportive. What were India's motives? According to one commentator, India wanted to obtain from the United States military and technical assistance as well as support for its drive for a permanent seat in the United Nations Security Council—"a good way to grease the wheel of India's rise to superpower status."[13] A more immediate objective, it appears, was the desire to gain access to U.S. surveillance data, especially on Chinese and Pakistani missile sites.[14] A possible consideration was a strategic tie-up with the United States against China.[15] But these explanations are not enough. They do not explain why an India long committed to global disarmament should have been willing to countenance the abandonment of the centerpiece of the existing structure of arms control: the ABM Treaty. Furthermore, why, despite their constant concern with the Chinese threat, were Indian leaders unperturbed by the possibility of a Chinese buildup in response to NMD? The answer lies in the

character of Indian strategic culture, more specifically, Indian strategic culture with respect to nuclear weapons.[16]

Indian thinking about nuclear weapons has always been a mix of power-oriented realism and idealistic restraint. While the realist element has been attracted to the possibilities offered by nuclear deterrence, the idealist element has found nuclear weapons morally abhorrent and hence sought to undo their potential effects through global disarmament. This latter aspect of Indian nuclear-strategic thought would find missile defense conceptually appealing. It is not surprising that the Indian response to the Bush initiative should have focused largely on the shift away from MAD and the space this creates for significant arms reductions. That the capacity to defend against missiles is taken seriously by the Government of India is evident from its long-standing interest, dating back to a time when the Bharatiya Janata Party (BJP) was not in power, in developing its own missile defense capacity. Indian equanimity vis-à-vis the possible upgrading of China's arsenal is also explained by its nuclear-strategic culture. India has never been particularly anxious about its vulnerability to a qualitative and quantitative gap between China's nuclear inventory and its own. While some Indian strategists have been wont to focus on typically American concerns relating to vulnerability to preemption, the fact that the pace of India's nuclearization has been leisurely at best is indicative of a distinct lack of enthusiasm for the operational minutiae of nuclear possession. Indian political leaders have often been accused of an overly political approach to nuclear weapons. That, I suggest, is one of their strengths. It is an understanding that underlies their commitment to existential deterrence—an acutely insightful perception of the essentially political character of nuclear weapons, which explains their acceptance of the imbalances and anomalies that preoccupy professional deterrence theorists. In light of this, the BJP-led government's relaxed acceptance of missile defense and their obvious intent—to extract the fullest advantage from a policy they are intrinsically comfortable with—is understandable.

India's Missile Defense Debate

The debate over missile defense has been somewhat different from similar debates in the past. Earlier, public discussions on the CTBT (which India rejected in 1996) and on the 1998 nuclear tests demarcated fairly clearly the dividing line between those who thought nuclear weapons to be a boon and those who deemed them to be a curse. This time, however, opposition to the government's position has come not only from the generally Left-leaning peace constituency, but also from staunch nationalists on the other side of the ideological divide. Not only that, the new strategic bedfellows use the same language to oppose the government and its supporters, which is not a little ironic, since the Left critics harbor a strong antipathy toward nuclear weapons, whereas the nationalists are at a minimum comfortable with a nuclear option.

The chief objection of the critics is that missile defense would have a destabilizing domino effect reaching all the way from the United States to

South Asia.[17] The American program would cause China to embark on a qualitative and quantitative buildup. This would likely entail an expanded arsenal, multiple-warhead (MIRVed) missiles, and the adoption of an alert posture. In India, the change would be perceived as threatening, the balance between moderates and hawks would tilt in favor of the latter, and a buildup would commence, followed by a like response from Pakistan. The result would be rising regional instability, raising the dire prospect of an already unstable India–Pakistan relationship sliding into war. American critics, including former Secretary of State Madeleine Albright, echo this view.[18] Indians also fear that a China antagonized by American missile defense may draw even closer to Pakistan and accelerate strategic cooperation with it.[19] This is an emotive issue. Indians have long complained about the China–Pakistan nuclear and missile nexus as the central component of China's efforts to "contain" and "encircle" India.

Another criticism is that NMD will have a disequilibrating effect on the global structure of arms control.[20] The United States' rejection of the ABM Treaty is seen as the first step toward this.[21] It will not only present a difficult roadblock to further reductions, but also enhance tensions everywhere through the revival of arms racing. Ongoing efforts to agree on a fissile material control treaty (FMCT) would be adversely affected, particularly if India and Pakistan seek to stockpile larger quantities of fissile materials in order to build more bombs. One critic observes that missile defense is not a truly defensive system, but is in fact a "means for bolstering offense" with no design for disarmament, and Indian support for it shows that "[w]e have now deflected sharply from the elimination goalpost and are now adrift in the uncertain and dangerous course of a new weapon system."[22] The offensive capabilities said to be inherent in missile defense are a source of discomfort for several critics. They are troubled by the prospect of a United States made less vulnerable by NMD becoming an aggressive power.[23] This brings to the fore an image that has not quite faded from the Indian strategic worldview: the fear of being pushed around by a hegemonic power.[24]

On the other side, a number of analysts have found merit in India's stance. First, the domino theory is rejected. One argument, made before the Bush speech of May 2001, is that China will not react aggressively to a U.S. NMD because it will have no need to: it will have adequate recourse to countermeasures, which are easier and cheaper to acquire than sophisticated weapons.[25] Another—also expressed early—is that it does not really matter because India has long accepted an India–China disparity anyway: "What India is looking for is credible nuclear deterrence and not nuclear parity."[26] Furthermore, simple pragmatism backs the Indian position. Since the United States will go ahead with missile defense regardless of what others say, why not hop aboard the bandwagon and try to extract the maximum advantage?[27] It is, moreover, a "wily political decision" since it lauds the U.S. statement on arms cuts without supporting NMD directly.[28]

Another argument in favor of supporting the United States goes a little further. It sees NMD as providing an opportunity for India to engineer a

breakthrough in its relationship with the United States. The American shift from established "nuclear theology" to missile defense opens the door for a fruitful arms control dialogue between the two countries.[29] The result would be an improved strategic understanding between them. Finally, the Bush initiative is seen more broadly as heralding the "demise of the old nuclear order," which rested on the twin pillars of MAD and the NPT, both anathema to India's strategic thinking and interests.[30] It follows that India should be supportive of it.

The arguments outlined above are cast in political-strategic as well as military-strategic terms, but the latter are the basis for the former. Opposition to NMD and to India's stance on it rests fundamentally on the understanding that its military consequences are undesirable: NMD will alter the operational calculus of the nuclear players, and their resultant actions and reactions will have an adverse impact on Indian security. Supporters of the Indian position hold generally that operational effects do not matter or are of little consequence. The real significance of NMD is *political*: it provides the basis for a paradigm change, whether with regard to the global nuclear order and the prospects for arms control or, more narrowly, with respect to Indo-U.S. relations. I find the latter case more persuasive. However, it needs to be argued at greater length since it is far from self-evident that the military implications of missile defense are not as undesirable as critics hold. I will attempt below a more thorough consideration of the military and political aspects of missile defense from the Indian perspective than is evident in the literature.

To begin with, there are some important difficulties in the opponents' position that need to be addressed. First of all, they take as axiomatic that any disequilibrium in military "balances" will lead to arms racing. This, as I show here, is based on an overly simplified understanding of the phenomenon of arms racing and the variable dynamics that underlie it. Not all changes in the balance of forces result in arms racing, and not all arms racing is the consequence of changes in the balance of forces. Mitigating factors and policy choices are important in determining the relationship between them. Critics are also off the mark when they express disappointment that the positive direction taken by developments in arms control after the end of the Cold War is being adversely affected by missile defense. The reality is that, after the flurry of arms control initiatives that marked the closing stages of the Cold War and its immediate aftermath, the momentum of arms control has actually *slowed down* significantly. The optimism of the early post–Cold War phase—the hope that nuclear weapons could now be delegitimized and eventually done away with—has receded. Despite the absence of serious nuclear threats for a decade, the major nuclear powers have done little to retreat from their overkill postures. It is in this context that, perhaps, a paradigm shift in the fundamentals of doctrine can be seen as a small ray of hope.

That having been said, I offer arguments that are supportive of the basic stand taken by the Indian government on missile defense. I present doctrinal

arguments to show that both NMD and TMD are acceptable (with qualifications) because they will, at worst, do little harm to Indian security, and, at best, augment it to an appreciable degree.

Why NMD is Acceptable

I begin with a simple assertion: deterrence is really not about weapons inventories and their operational capabilities. It is at heart about the willingness, or lack of it, to accept immense damage to one's society in relation to one's objectives.[31] It is hard to think of any objective that justifies the risk, even a small risk, of cataclysmic damage to one's society. Hence, those who are even minimally threatened by the possibility of nuclear weapons being used against them are invariably compelled to restrain themselves. In short, states that possess nuclear weapons (hereafter, for the sake of brevity, I use the term "nuclear states") do not attack other states that have the same capability. Whether or not a nuclear state possesses missile defense capability, it will not be subject to nuclear attack because it possesses some capacity to retaliate with its own nuclear weapons.[32]

Even the most robust missile defense does not meaningfully augment deterrence by undermining an adversary's capacity to threaten it. The possessor of a robust NMD will always be vulnerable to some unknown quantum of risk from an adversary's first or second strike. No defensive system, no matter how sophisticated, can be known in advance to be 100 percent effective. That being the case, even the best of NMD systems cannot guarantee a total defense, not even from an adversary who possesses a handful of weapons. This means that the possessor of a highly developed NMD *cannot* use it as a cover to launch a first strike in the anticipation that there will be no counterstrike. A small risk with very large potential consequences will remain. What possible objective can justify the taking of such a risk? Once an adversary has nuclear weapons, it has deterrent capability; and one's possession of missile defense has only a notional—not a real—effect on that deterrence capability. In effect, a small nuclear power has no good reason to be afraid of an adversary, large or small, possessing NMD. From the standpoint of the possessor of NMD, its defensive capability will not be a disincentive to proliferation. Nor will NMD give it an "edge" in its relationship with a small nuclear power.

This, however, does not mean NMD is without value. It does have some value: it can limit damage to oneself in the event deterrence fails (or, if you prefer, does not work). There are three ways in which deterrence might not work: if there is an accidental launch, if there is an unauthorized "renegade" launch, and if an undeterrable adversary engages in a suicidal launch. Given the extensive precautions and safety measures surrounding nuclear weapons, the probability of any of these events occurring is extremely low. Before "Black Tuesday," the last would have been considered by most of us, prone as we are to clothe deterrence in rationality, as unthinkable. Today, it cannot be ruled out. It follows that, notwithstanding all the perfectly sensible

objections to missile defense—that it is technologically questionable, that it is too expensive, and that it is unlikely to work very well—its legitimacy lies in its capacity, regardless of the level of its sophistication and its operational effectiveness, to enable a significant number of people to survive an intended or unintended nuclear strike. To put it differently, the weight of risk works the other way here: the small risk that remains has to be countered to the extent possible. It may be viewed as a form of "catastrophe insurance."[33] There is a moral obligation on the part of the state to do so. There can, in principle, be no argument against saving *some* lives in the event of a nuclear strike. How an actual system of defense is conceived of is a matter of the tradeoff expected between costs and risks.

The argument against NMD is couched in quite different terms. It is an argument that leans on numerical balances and on the understanding that the *certainty* of very large-scale destruction underpins deterrence. But, in practice, it is not one's own certainty of raining untold destruction upon the other that deters; rather, it is the other's *uncertainty* about *preventing* such destruction that deters. The argument against NMD, then, reveals a logic resting on weak foundations. NMD has no fundamental effect on nuclear weapons.

But there is still a major difficulty. Even notional capabilities such as NMD or overly large arsenals evoke insecurity. In the anarchic system that is international politics, the mere possession of significant military capability by a state is a source of some discomfort to other states. The extent of that discomfort varies with the overall character of relationships: the greater the cooperation, the less the discomfort. In relationships characterized by uncertainty or tension, even if there are no powerful sources of hostility, the numbers game starts to assume significance. Thus, even as the United States and China move toward greater cooperation through steadily increasing trade and investment relations, the politics of military numbers is reduced, but not eliminated. This is particularly true of the politics relating to nuclear weapons since the potential consequences of their use, however unlikely, are so great. In consequence, such relationships function at two levels. At the primary level, there is mutually reinforcing economic cooperation and interdependence. At the secondary level, there is a game of move and countermove dictated in large part by the distribution of notional capability, and by changes in that distribution.

If one does not make this distinction, it is arguable that belief in the potential effects of NMD is sufficient to generate behavior that is self-fulfilling: the *belief* that NMD is dangerous might be sufficient to create the adverse reaction of arms racing and set in motion a destabilizing process. But once a more discriminating view is taken, different outcomes are possible. Since the dangers associated with NMD are not primary, it becomes possible to mitigate the perceptions that make it appear as an object of fear and tension. This can be accomplished by means of a strategy of reassurance. This has been evident for some time, though in a limited way, by the perceptible shift in the Russian response to NMD, from outright rejection to a willingness to

listen, discuss, and negotiate. That President Putin should have departed significantly from his position on NATO expansion, to which Russian opposition has been even stronger than to NMD, is indicative of the possibilities.

U.S.–Russian cooperation over the past decade has been at the primary level, involving a sharp decline in mutual threat perceptions, collaboration on military-strategic issues (the Gulf, Russian nuclear safety, and stability), and growing levels of economic interaction. Hiccups on issues where their views have been divergent, such as U.S. interventions in Bosnia and Kosovo or Russia's handling of the Chechen rebellion, have been secondary. Differences over NMD and the Bush Administration's stated objective of dismantling the ABM Treaty fall in the latter category. The divergence over this issue has appeared significant because of the extent of the Bush program's departure from established consensus between the two countries. Should the gulf be narrowed, the problem will become less serious. There are already signs that this may happen. The scope for a reassurance-driven approach to NMD is increasing. Despite the disagreement on the ABM Treaty, the United States and Russia remain committed to arms control and, more importantly, to a closer Russian relationship with NATO. The same applies to the U.S.–China relationship. The United States has conveyed its acceptance of Chinese strategic modernization and shown an interest in engaging China on missile defense. One must also bear in mind that an arms race is precisely what both Russia and China do not want at a time when their preoccupations revolve more around economic growth and stability than anything else. Not surprisingly, neither Russia nor China has reacted strongly to the American rejection of the ABM Treaty.

A U.S.–China arms race is certainly not inevitable. In this connection, Bruno Tertrais's distinction between two types of arms race is useful.[34] Type-I arms races are basically strategic races, whereas Type-II arms races are driven by symbols and politics. While I am not at one with Tertrais in the example he chooses to describe them, the conceptual difference is important. I will attempt my own definition. Where arms races are related to actual capabilities on the field of battle, such that they would affect actual outcomes, they may be classified as Type-I or strategic arms races. Where arms races have little relevance to actual outcomes on the battlefield or to the employment of capabilities, they may be characterized as Type-II or symbolic arms races. Further, the two types of arms races relate differently to the types of political relationship I have described. In a relationship of hostility at the primary level, an arms race may be either Type-I or Type-II. Where the relationship is one of cooperation at the primary level and tension is restricted to the secondary level, the arms race must by definition be Type-II or symbolic. While symbolic politics may in a sense be as "real" as strategic politics—the eye of the beholder being a major determinant—it is nonetheless far more amenable to reassurance than is strategic politics. As such, notwithstanding the many differences between them, it is well within the realm of possibility that the United States and China could come to an understanding

that prevents an arms race from the deployment of an American NMD. Some of the possibilities for reassurance that the United States can offer include a very limited and "non-threatening" NMD deployment, enhanced political and economic cooperation on a range of issues, and prudence on Taiwan. Again, it is worth pointing out that an expansionary response is not the most cost-effective one for China, which would not like to divert precious funds from its main goal of economic development.[35]

In light of this discussion, it is unlikely that there would be cause for anxiety in India about China's reaction to a U.S. NMD. Such nuclear expansion as it does undertake will not in any case reduce India's deterrence capacity in the sense that I have explained above. India has long accepted the nuclear "gap" between itself and China. The widening of the "gap" will not make much difference. China will still be vulnerable to an Indian strike as and when Indian capacity develops. The number and relative sophistication of Chinese forces do not matter. Once Chinese targets are targeted by even a small number of Indian missiles, it is immaterial whether China has a hundred or two hundred weapons targeting India. No Chinese leader can risk even a single Indian missile hitting a Chinese city. There is no rationally conceivable objective that China can hope to attain that would justify such a risk. It need scarcely be added that, with China very unlikely to respond in a big way to a U.S. NMD, and with India equally unlikely to expand its capabilities, Pakistan too will not be affected by the putative domino effect of missile defense.

Once the alleged adverse effects of NMD are disposed of, it makes sense to support missile defense because it attempts, to whatever degree, to save human lives. Indeed, it is a moral imperative. Moreover, the argument that missile defense has intrinsic merit because it marks a radical departure from a static nuclear order also carries considerable weight. The Reaganite view that nuclear weapons are inherently evil, which underlies SDI and propels the present missile defense program, strikes a powerful chord in Indian thinking, which has always rejected the idea that the security of nations can be maximized by an unbridled threat to destroy one another. The rejection of the moral validity of nuclear weapons provides a much sounder basis for arms control than does the Cold War conception of stability based on assured destruction. Indeed, the weakening of MAD and the consequent fillip to arms reduction may turn out to be the primary contribution of the missile defense program.[36]

The Case for a Limited Missile Defense

For the United States, defense against theater missile threats has been a long-standing concern. The extensive use of missiles by other states in strategically important areas, notably during the Iran–Iraq War and the Soviet War in Afghanistan, created a growing concern about a new "generic threat" to U.S. forces.[37] The most significant direct threat came during the Gulf war, in which the largest single instance of American casualties resulted from an

Iraqi Scud missile attack. TMD became an "Asian issue" only after China's missile launches in the Taiwan Strait (1995, 1996) and the North Korean launch of a Taepodong missile (1998). These events also created a serious interest in TMD among American allies—notably Japan, South Korea, and Taiwan—who were (and are) relatively indifferent to NMD.[38] While none of this impacted directly on India, it certainly enhanced awareness of the problem. Though less concerned about U.S. NMD, India had a more long-standing interest in missile threats related to missile defense.[39] Its attention to this was attracted by the Arab–Israeli War of 1973, the Iran–Iraq War, the Soviet War in Afghanistan, and Operation Desert Storm. American use of Tomahawk missiles in Afghanistan (1998) and Kosovo (1999) added to a general sense of unease. The concern became more serious following reports about the transfer of Chinese M-11 missiles to Pakistan and the deployment of Chinese nuclear missiles in Tibet. Since the mid-1990s, the growth of Pakistani nuclear and missile capabilities has underlined the seriousness of the problem.

The range of missiles developed under the Integrated Guided Missile Development Program inaugurated by Prime Minister Indira Gandhi in 1983 included not only offensive missiles such as the nuclear-capable Prithvi and Agni, but also the Akash surface-to-air missile, which has TMD potential. Indian scientists have developed the Rajendra phased array radar and negotiated with Russia for its S-300 anti-tactical ballistic missile (ATBM) system, and also with Israel for the Arrow ATBM and the Phalcon airborne early warning (AEW) platform.[40] While the cost factor is a serious constraint (the S-300 is believed to cost from $55 million to $160 million depending on the exact type), Indian interest has been sustained. A recent report says India is negotiating with Israel to integrate the technology of Akash and the Arrow-2, and also the Rajendra radar with the Arrow-2's Greenpine radar, which can track a missile from a distance of 300 km.[41]

How have India's nuclear adversaries reacted? China does not consider India a serious nuclear threat because of the limited reach of Indian weapons. There is some concern, though, about Indo-Russian and Indo-Israeli cooperation and where it might lead in the long run.[42] But the Chinese approach to missile defense has been more political than military, as David Finkelstein has shown.[43] Notwithstanding the tension arising from the border dispute and the Sino-Pakistani nuclear and missile nexus, the China-India relationship remains stable. Trade is on the rise and there is a tacit understanding that differences should not stand in the way of cooperation.

The same is not the case with the India–Pakistan relationship. Here, military tensions have been high. While the two have not been at war since 1971, there has been intense acrimony over Kashmir, an on-going (since the mid-1980s) low-intensity conflict in the Siachen Glacier region, periodic crises over large-scale military exercises and associated threat perceptions (1986–1987, 1990), and an armed clash of significant proportions in the Kargil sector of Kashmir (1999). Competitive nuclear testing in 1998 and missile testing before and after that date have heightened the tension. The

Pakistani response to American NMD and to the Indian interest in missile defense has been negative. At the UN Conference on Disarmament in Geneva, Foreign Secretary Inamul Haq argued that the creation of "shields" would cause others to improve their "lances," which could "heighten tensions between major powers, jeopardize the global strategic balance and turn back the disarmament clock."[44] Shortly after Bush's May 2001 speech, Pakistan's Chief Executive, General Parvez Musharraf, criticized the NMD program, averring that it could "jeopardize international stability, trigger a new arms race and undermine international efforts aimed at arms control and disarmament."[45] The Pakistani view is in accord with the domino theory on NMD, which springs from a MAD-based perception that one man's missile defense is another's first-strike vulnerability. That, as I have shown, is of dubious merit.

For Pakistan, an Indian missile defense is more worrying still.[46] Seen from the MAD perspective, Indian missile defense creates a problem of vulnerability and credibility for Pakistan's nuclear deterrent. It nevertheless does not necessitate an arms-racing response. As one Pakistani analyst sees it, an arm race is unaffordable. It would be more appropriate to counter an Indian missile defense with hardened and mobile basing countermeasures, and a small numerical preponderance in relation to Indian defense capability.[47] A South Asian ABM Treaty is also desirable in the reasoning of this analyst.[48] However, a South Asian ABM Treaty is based on the flawed assumptions I have criticized above. The doctrinal case for a limited missile defense is basically the same as that I have made with respect to U.S. NMD, which is that it neither reduces nor augments deterrence; that it is consequently not inherently destabilizing; and that it has the merit of promising some damage limitation in the event, unlikely though that may be, of deterrence failing.

From India's perspective, deterrence failure cannot be ruled out in either of its adversarial nuclear-strategic relationships. But India's strategic planners have particular reason to be concerned about the relationship with Pakistan. Deterrence may not work in two ways: as a result of command and control errors arising from short reaction time resulting in accidental launches, or if Pakistani nuclear weapons fall into the wrong hands. (From their point of view, Pakistani strategists would worry about the same things in reverse.) Strategic defense makes sense if it is not intrinsically destabilizing, which, as I have shown, is the case. Realistically, no matter how strong its missile defense capabilities—and these are bound to be limited because of the sheer magnitude of the task of defending all or even most of its strategic assets—India cannot be certain of defending adequately against a Pakistani strike. To reiterate, Pakistan will not be rendered vulnerable by Indian missile defense because India will still be deterred. No Indian decision maker can possibly consider acceptable even a small risk of a single Pakistani bomb detonating over an Indian city. By adding more weapons to its inventory, Pakistan will not alter India's strategic calculus. There will be no need to. The purpose of an Indian missile defense can at best be to try and minimize damage after deterrence has failed, which is far from saying that it will give an Indian leader the confidence to strike first.

The existing India–Pakistan agreement not to attack each other's nuclear facilities carries a fundamental underlying assumption that is congruent with missile defense. The very notion that nuclear facilities should not be attacked implies that they are not acceptable targets. In that case, the idea of defending them cannot be termed unacceptable. Thus, it is reasonable for India and Pakistan to come to an understanding that extends the agreement and permits the defense of nuclear facilities. This might be later extended to other targets.

The process of coming to such an agreement would obviously involve much discussion and negotiation. The important point is to come to an understanding that, by its very nature of minimum deterrence, to which both countries adhere, does not require the principles of assured destruction to underpin it. A clearly understood and enunciated doctrine of unacceptable damage is not only adequate for deterrence, but also much more conducive to strategic stability. It does not exclude missile defense, for each understands that the other is easily deterred by a small risk of large-scale damage. On the contrary, it accommodates missile defense, in itself a moral obligation for governments, by accepting that a less than absolute capacity to defend against missiles leaves deterrence intact. At the political level, India needs to assuage Pakistani anxieties by means of reassurance initiatives, that is, unilateral signaling to show its commitment to strategic stability and arms control.[49] While the Kargil episode was a setback, there is still a need—and scope for—reassurance-based efforts toward strategic stability, whether through bilateral or unilateral efforts. These may take the form of nuclear confidence-building measures, regular discussions aimed at building doctrinal bridges, perhaps a mutual commitment, tacit or formal, to eschew deployment, and so on.

Conclusion

I have argued above that, on the whole, missile defense has been much misunderstood. Its efficacy is limited. It does not meaningfully alter the fundamentals of deterrence, not even in so-called asymmetric nuclear relationships. The preoccupation of established deterrence thinking with numbers and vulnerability is off the mark. Numbers are not important; risk is. Even a small risk of nuclear damage overrides the possible objectives to be attained by accepting that risk. In effect, the only utility of missile defenses is the extent, always limited, to which it can limit damage after deterrence has failed. The utility of missile defense being limited, its fate will eventually be decided by politics and the cost factor. The more extreme American NMD ambitions will be moderated by both. That in turn will limit Russian and Chinese responses. The likelihood of a domino effect on India, and in turn Pakistan, is very low. Such secondary fears as are evoked by missile defense can be assuaged by active reassurance strategies.

Despite its obvious merits, India cannot pursue missile defense in a big way. It is simply unaffordable. Nevertheless, it is incumbent upon the government to take at least some steps to protect its citizens against the small

risk of deterrence failure by error, accident, or twisted design. A limited missile defense to protect major targets (cities, nuclear facilities) is desirable for this purpose. To the extent that this evokes fears in Pakistan, a strategy of reassurance may be used to alleviate them.

The primary contribution of missile defense to a better world may be doctrinal. The weakening of MAD and its associated baggage—the requirement of large, sophisticated, and diverse arsenals assuredly capable of inflicting monumental damage—may eventually generate a new momentum for arms control by facilitating deep cuts. That would be a welcome development for all states, nuclear and nonnuclear. From the Indian perspective, as official statements have already acknowledged, the expanded potential for arms reduction offered by missile defense is in accord with India's sustained commitment to reducing the global threat of nuclear weapons. Even if it does not happen, missile defense will do no harm.

Finally, a collaborative approach to missile defense can be a solid basis for strengthening Indo-U.S. relations. Nonalignment was a strategy born of weakness and fear. A stronger and more confident India can afford to move closer to the United States, as indeed it has been doing. For all its periodic proneness to unilateralism, the United States, as a hegemonic power, has learned to work with existing allies and to build coalitions. It has shown this capacity in the Gulf, in the Balkans, and in Afghanistan. As an "emerging power," India can offer it useful economic, political, and military cooperation.[50] India has much to gain from a stronger relationship with the United States, not least the possibility of augmenting its small missile defense capability. Cooperation on missile defense can be one pillar—an important one—to buttress this growing relationship while simultaneously enhancing India's security.

NOTES

1. The author would like to thank Sunil Dasgupta, Christopher Gagné, Stephen P. Cohen, Brian Woo, Šumit Ganguly, Michael Krepon, and George Quester for their comments on a draft version of this paper. Needless to say, they are only responsible for its strengths. An earlier version of this essay was originally published in Michael Krepon and Chris Gagné (eds.), *The Impact of US Ballistic Missile Defenses on Southern Asia* report no. 46 (Washington, DC: The Henry L. Stimson Center, July 2002), 1–20.
2. "India Asks US to Give Up Missile Testing," the *Hindu* (India) (July 4, 2000) cited in Michael J. Green and Toby F. Dalton, "Asian Reactions to US Missile Defense," *NBR Analysis* vol. 11, no. 3 (November 2000): 35.
3. "US Missile Test Won't Affect Indian Nuclear Plans," the *Hindu* (India) (July 10, 2000), 1.
4. "Talks with Albright, Talbott Fruitful, Says Jaswant," the *Hindu* (India) (July 30, 2000), Internet: http://www.hinduonnet.com/thehindu/2000/07/30/stories/01300003.htm.
5. Nicholas Berry, "US National Missile Defense: Views from Asia," *National Missile Defense: What Does It All Mean?* (Washington, DC: Center for Defense Information, September 2000), 28.

6. C. Raja Mohan, "India Welcomes Bush Plan for Cuts in N-arsenals," the *Hindu* (India) (May 3, 2001), Internet: http://www.hinduonnet.com/thehindu/2001/05/03/stories/01030001.htm; Pramit Pal Chaudhuri, "India Endorses Nuke Strategy Shift," *Hindustan Times* (India) (May 3, 2001), Internet: http://www.hindustantimes.com/nonfram/030501/detfro02.asp.
7. Nicholas Berry, "Did India Endorse Missile Defense? Not Exactly," Center for Defense Information Asia Forum, (May 29, 2001), Internet: http://www.cdi.org/asia/fa052901.html.
8. J. N. Dixit, " 'India's Response to NMD was Hasty,' " http://www.indiaabroad daily.com (May 19, 2001).
9. Fred Weir, "Russia Offers NMD System to India," *Hindustan Times* (India) (June 7, 2001), Internet: http://www.hindustantimes.com/nonfram/070601/detFOR06.asp.
10. Ibid.
11. C. Raja Mohan, "Indian Support to NMD Not at Russian Cost," the *Hindu* (India) (May 5, 2001), Internet: http://www.hinduonnet.com/thehindu/2001/05/05/stories/01050002.htm.
12. "USA, Russia Should Discus NMD: India," *The Statesman* (India) (May 5, 2001).
13. Steve LaMontagne, "NMD Will Slow India's Rise," the *Hindu* (India) (June 14, 2001), Internet: http://www.hinduonnet.com/thehindu/2001/06/14/stories/0514134a.htm.
14. Atul Aneja, "Defense Ministry Debating Deal with US over NMD," the *Hindu* (India) (May 13, 2001), Internet: http://www.hinduonnet.com/thehindu/2001/05/13/stories/0113000c.htm.
15. View expressed by Bharat Karnad in Ramananda Sengupta, "Why India Embraced NMD," *Rediff.com* (India) (May 10, 2001), Internet: http://www.rediff.com/news/2001/may/10nmd.htm.
16. For a detailed analysis, see Rajesh M. Basrur, "Nuclear Weapons and Indian Strategic Culture," *Journal of Peace Research* vol. 38, no. 2 (March 2001), 181–198.
17. Deepanshu Bagchee and Mathew C. J. Rudolph, "Misguided Missiles," the *Hindu* (India) (May 5, 2001), Internet: http://www.hinduonnet.com/thehindu/2001/05/05/stories/05051349.htm; Arpit Rajain, "The US National Missile Defense and South Asia," Article no. 395 (New Delhi: Institute for Peace and Conflict Studies, 30 July 2000), Internet: http://www.ipcs.org/issues/articles/395-ndi-arpit.html; Mandavi Mehta, "Looking Beyond the Subcontinent," *Newspaper Today* (India) (May 14, 2001), Internet: http://www.thenewspapertoday.com; Muchkund Dubey, "Missile Defense and India," the *Hindu* (India) (May 9, 2001), Internet: http://www.hinduonnet.com/thehindu/2001/05/09/stories/05092523. htm; Achin Vanaik, "Ballistic Missile Defense: Consequences for South Asia," Nuclear Age Peace Foundation (2002), Internet: http://www.wagingpeace. org/articles/bmd/vanaik_consequences_ for_south_asia.html; Gaurav Kampani, "How a US National Missile Defense Will Affect South Asia," *CNS Reports* (Monterey, CA: Center for Nonproliferation Studies, Monterey Institute of International Studies, May 2000), Internet: http://cns.miis.edu/ pubs/reports/usmslsa.htm. In fairness, I must acknowledge this was my view as well. See Rajesh M. Basrur, "Missile Defense; An Indian Perspective," Nuclear Age Peace Foundation, 2001, Internet: http://www.napf.org/articles/bmd/basrurindianperspective.html.

However, as will be evident from this paper, I have revised my opinion on this specific point.

18. "Bush's Security Team Can Destabilize South Asia," *Hindustan Times* (India) (January 12, 2001), Internet: http://www.hindustantimes.com/nonfram/120101/detFOR05.asp. For a more qualified assessment, see Timothy D. Hoyt, "South Asia," in James J. Wirtz and Jeffrey A. Larsen, eds., *Rockets' Red Glare: Missile Defenses and the Future of World Politics* (Boulder, CO: Westview Press, 2001). See also Brad Roberts, "US Ballistic Missile Defenses: Implications for Asia," Paper presented at the Second Collaborative Workshop on East Asia Regional Security Futures, Nautilus Institute and Center for American Studies, Fudan University, at Shanghai (3–4 March 2001), Internet: http://www.nautilus.org/nukepolicy/workshops/shanghai%2D01/robertspaper.txt; and Green and Dalton, "Asian Reactions to US Missile Defense."
19. Bagchee and Rudolph, "Misguided Missiles"; and Kampani, "How a National Missile Defense Will Affect South Asia." See also the views of the opposition Congress Party in C. Raja Mohan, "Cong. [*sic*] Against Antagonizing China on NMD," the *Hindu* (India) (May 8, 2001), Internet: http://www.hinduonnet.com/thehindu/2001/05/08/stories/01080004.htm.
20. Bagchee and Rudolph, "Misguided Missiles"; Vanaik, "Ballistic Missile Defense"; Rajain, "The US National Defense and South Asia"; Kampani, "How a US Missile Defense Will Affect South Asia"; and V. R. Raghavan, "Missile Defense and Strategic Stability," the *Hindu* (India) (May 17, 2001), Internet: http://www.hinduonnet.com/thehindu/2001/05/17/stories/05172523.htm.
21. "A New Arms Race?" *Hindustan Times* (India) (December 12, 2001), Internet: http://www.hindustantimes.com/nonfram/151201/detedi02.asp; "Offensive Defence," *Times of India* (December 18, 2001); and Manpreet Sethi, "A Goodbye to Global Security?" *Indian Express* (December 19, 2001), Internet: http://www.indian-express.com/ie20011219/ed4.html.
22. Dubey, "Missile Defense and India."
23. Achin Vanaik, "India's Response to the NMD," the *Hindu* (India) (May 25, 2001), Internet: http://www.hinduonnet.com/thehindu/2001/05/25/stories/05252524.htm; Amulya Ganguli, "America Rules, Okay?" *Hindustan Times* (India) (May 14, 2001), Internet: http://www.hindustantimes.com/nonfram/140501/bigidea.asp; Inder Malhotra, "Long On Flowery Rhetoric, Short On Realism," the *Hindu* (India) (May 10, 2001), Internet: http://www.hinduonnet.com/thehindu/2001/05/10/stories/0510134a.htm; and Dubey, "Missile Defense and India."
24. "Offensive Defence," *Times of India.*
25. C. Raja Mohan, "Indo–US Dialogue On NMD?" the *Hindu* (India) (March 14, 2001), Internet: http://www.hinduonnet.com/thehindu/2001/03/14/stories/05142523.htm.
26. S. Chandrasekharan, "NMD, TMD and India: Let Not Our Imagination Run Riot," paper no. 140 (Noida, India: South Asia Analysis Group, August 30, 2000), Internet: http://www.saag.org/papers2/paper140.html. This view has also found support in the US. See O'Hanlon and Lindsay, *Defending America*, 137–39.
27. Interview with Rear Admiral Raja Menon (retd.), *Newspaper Today* (India) (August 7, 2001), Internet: http://www.thenewspapertoday.com/interview/index.phtml?INTERVIEW=INT_RAJA. See also "Shield for a Sword," *The*

Telegraph (India) (May 7, 2001), Internet: http://www.telegraphindia.com/archive/1010507/index.htm.

28. P. R. Chari, "Posers on the NMD," the *Hindu* (India) (June 6, 2001), Internet: http://www.hinduonnet.com/thehindu/2001/06/06/stories/05062523.htm.
29. Raja Mohan, "Indo–US Dialogue on NMD?"
30. C. Raja Mohan, "In Praise of Diplomatic Exuberance," the *Hindu* (India) (May 7, 2001), Internet: http://www.hinduonnet.com/thehindu/2001/05/07/stories/05071348.htm.
31. The essence of this argument is drawn from Kenneth Waltz, "Nuclear Myths and Political Realities," *American Political Science Review* vol. 84, no. 3 (September 1990): 731–45.
32. This may not entirely preclude conflict below the level of full-scale conventional conflict. In this respect, there is some debate over the implications of the Kargil conflict (1999) between India and Pakistan. For divergent viewpoints, see Michael Krepon and Chris Gagné eds., *The Stability–Instability Paradox: Nuclear Weapons and Brinkmanship in South Asia*, report no. 38 (Washington, DC: The Henry L. Stimson Center, June 2001) and Rajesh M. Basrur, "Nuclear Confidence-Building in the Post-Kargil Scenario," in Moonis Ahmar ed., *The Challenge of Confidence-Building in South Asia* (New Delhi: Har-Anand, 2001).
33. William J. Perry, "Preparing for the Next Attack," *Foreign Affairs* vol. 80, no. 6 (November/December 2001): 31–45. The metaphor may not be entirely appropriate, since missile defense is a form of prevention and not compensation, but the argument is nevertheless sound.
34. Bruno Tertrais, "Do Arms Races Matter?" *Washington Quarterly* vol. 24, no. 4 (Autumn 2001): 123–133.
35. On Chinese nuclear policy and options, see Robert A. Manning, Ronald Montaperto and Brad Roberts, *China, Nuclear Weapons and Arms Control: A Preliminary Assessment* (New York, NY: Council on Foreign Relations, 2000); Philip C. Saunders and Jing-dong Yuan, "China's Strategic Force Modernization: Issues and Implications for the United States," in Michael Barletta ed., *Proliferation Challenges and Nonproliferation opportunities for New Administrations* (Monterey, CA: Center for Nonproliferation Studies, Monterey Institute for International Studies, September 2000); and Li Bin, "The Impact of US NMD on Chinese Nuclear Modernization," Pugwash Online (April 2001), Internet: http://pugwash.org/reports/rc/rc8e.htm.
36. On the significance and desirability of a shift from MAD, see Michael Krepon, "Moving Away from MAD," *Survival* vol. 43, no. 2 (Summer 2001): 81–95.
37. David M. Finkelstein, "Theater Missile Defense in Asia," paper presented at the Second Collaborative Workshop on East Asia Regional Security Futures, Nautilus Institute and Center for American Studies, Fudan University, at Shanghai (3–4 March 2001), Internet: http://www.nautilus.org/nukepolicy/workshops/shanghai-01/finkelsteinpaper.html.
38. Berry, "US National Missile Defense."
39. Waheguru Pal Singh Siddhu, "Regional Perspective: South Asia," in *International Perspectives on Missile Proliferation and Defenses*, Occasional Paper no. 5 (Monterey, CA: Center for Nonproliferation Studies, Monterey Institute of International Studies, March 2001).
40. Gregory Koblentz, "Theater Missile Defense and South Asia: A Volatile Mix," *Nonproliferation Review* vol. 4, no. 3 (Spring–Summer 1997): 54–62.

41. Atul Aneja, "Indo-Israeli Partnership for A Missile Shield," the *Hindu* (India) (September 6, 2001), Internet: http://www.hinduonnet.com/stories/0206000h.htm.
42. Roberts, "US Ballistic Missile Defenses," 5.
43. Finkelstein, "Theater Missile, Defense in Asia," 7–9.
44. Stephanie Nebehay, "Pakistan Warns on Dangers of US Missile Shield," *Yahoo! News* (January 5, 2001).
45. B. Murlidhara Reddy, "Musharraf Opposes NMD," the *Hindu* (India) (May 13, 2001), Internet: http://www.the-hindu.com/stories/01130003.htm. See also Celia W. Dugger, "US Nurtures Growing Defense Bond with India," *New York Times* (May 13, 2001), Internet: http://www.nytimes.com/2001/05/13/world/13INDI.html.
46. Zafar Nawaz Jaspal, "India's Endorsement of the US BMD: Challenges for Regional Stability," *IPRI Journal* vol. 1, no. 1 (Islamabad: Islamabad Policy Research Institute, Summer 2001): 28–43.
47. Ibid., 41–42.
48. Ibid., 40–41.
49. On reassurance, see Banning Garrett, "The Need for Strategic Reassurance in the 21st Century," *Arms Control Today*, vol. 31, no. 2 (March 2001), Internet: http://www.armscontrol.org/act/2001_03/garrett.asp; Andrew Kydd, "Trust, Reassurance and Cooperation," *International Organization* vol. 54, no. 2 (Spring 2000): 325–57; and John Steinbruner, *Principles of Global Security* (Washington, DC: Brookings Institution Press, 2000), 126–32.
50. On India as an "emerging power," see Stephen Philip Cohen, *India: Emerging Power* (Washington, DC: Brookings Institution Press, 2001).

10

Missile Defense: A Pakistani Perspective

Mutahir Ahmed

Ballistic missile defense is now a subject of debate at the national, regional, and global levels. While optimists view missile defense as providing protection from possible missile attacks, pessimists view missile defense as generating arms competition, insecurity, and opening a Pandora's box of arms proliferation.[1] In Pakistan, there is widespread pessimism about the likely consequences of ballistic missile defense (BMD) deployments. India's interest in missile defense technology and deployment is widely viewed as a very significant development, and an indicator of Indian designs and ambitions to acquire absolute regional superiority in the nuclear domain. Pakistan would be compelled to respond to Indian ambitions by increasing military cooperation with China and keeping its nuclear option open as the last resort in a war against India.

Pakistan, like Russia and the European Union, was greatly concerned by the Bush administration's abandonment of the Anti-Ballistic Missile (ABM) Treaty. Foreign Minister Abdul Sattar sought to prevent differences over this issue from affecting Pakistan's overall relations with the United States, arguing in more general terms that, "Strategic stability should prevail in the world."[2] Pakistan would look to China for continued support in the event of a changed strategic equation in South Asia resulting from missile defense deployments. As President Pervez Musharraf has stated,

> [The] Chinese role will remain vital, especially in changing geo-strategic realities. The end of Cold War led to a change in global equation, leading to emergence of regional hegemons, of countries with hegemonistic tendencies. South Asia is a victim of regional hegemonism. This creates regional imbalance which in turn, threatens peace.[3]

Pakistan's negative views toward missile defense are fully shared by China. Chinese officials have strongly opposed U.S. theater and national missile defenses, asserting that they could upset regional stability and the global strategic balance. China considers the renewed U.S. interest in missile

defense as reflective of a Cold War mentality, the U.S. penchant for military solutions, and unilateralism. Chinese officials also argue that missile defense deployments would encourage an arms race and missile proliferation, thereby threatening the Non-Proliferation Treaty (NPT) regime.[4] Most analysts view the extent of China's strategic modernization program as linked to the scope of U.S. missile defense deployments.[5] For example, the U.S. National Intelligence Estimate released in December 2001 estimates the number of Chinese warheads on intercontinental ballistic missiles could swell to four times its present size in response to U.S. national missile defense (NMD).[6] One possibility for China would be to equip its nuclear missiles with multiple warheads, a course of action that could require a resumption of nuclear tests. In addition, China is expected to replace its highly vulnerable, liquid-fueled missiles with solid-fueled missiles. Furthermore, China would feel less constrained to follow U.S. preferences regarding technology and missile transfers.[7] Beijing could react by ending its informal commitment to abide by the Missile Technology Control Regime guidelines. U.S. missile defense transfers to Taiwan would also be of great concern to Beijing for many reasons, including the possibility that Taiwan could apply missile defense technologies toward developing offensive systems.[8]

In contrast to the Chinese and Pakistani perspectives, India's position toward missile defense has become more accepting for several reasons. First, the pro-missile defense stance of the United States has been accompanied by proposals to reduce nuclear arsenals, which is consistent with India's stated policy of championing nuclear disarmament. Second, a shift in reliance from nuclear offense to missile defense—to the extent this is possible—would be a worthy goal that should be explored before passing judgment. Third, New Delhi might believe that the Chinese reaction to U.S. missile defense deployments would not be a strategic concern for India. Fourth, India may believe that it could benefit from participation with the United States in a missile defense plan, either through technology transfers, coproduction agreements, or deployments.[9]

In New Delhi's view, the prospective benefits of not opposing the United States on missile defenses might outweigh the difficulties created by China's missile buildup. India is eager to have U.S. sanctions lifted, and to gain a permanent seat in the United Nations Security Council. These goals might be achieved by entering into a strategic partnership with the United States in the region. Moreover, U.S.–India cooperation on missile defense could deflect pressure from India on the nuclear issue. New Delhi has created space to maneuver its way out of the nuclear quarantine imposed by the Comprehensive Test Ban Treaty (CTBT) and NPT regimes. Another more salient dimension of a prospective partnership or strategic alliance between the United States and India is the threat of Islamic fundamentalism and terrorism. Israel could become a third partner, providing New Delhi with additional technology and military transfers.[10]

India's new stance constitutes an ideological shift designed to cement an emerging partnership with Washington. New Delhi views Washington as its

main ally and a potential supplier of missile delivery systems against China, which is a common threat for both countries.[11] Indian officials are keen to exploit China–U.S. differences to maximum effect, without falling completely into the U.S. lap.[12] It is too early to determine whether India would acquire a BMD system of its own or whether such a system would be partial or nationwide. For the moment, India has only endorsed the U.S. NMD program, however, India may accord a higher priority to its own NMD system in the future.

Regional Competition and Missile Defense Deployments

China has switched from being a "strategic partner" during the Clinton administration to a "strategic competitor" in the Bush administration. The United States appears to be disturbed at the prospect of China becoming the largest economy in the next 25 years, if Beijing can maintain high growth rates. For its part, the Chinese government was perturbed by the scale and depth of U.S. military might displayed in the Balkan and Afghan wars, as well as by U.S. defense accords and basing arrangements around its periphery. China also reacted sharply to extended U.S. military assistance to Taiwan. In such changed geopolitical circumstances, China has reason to be concerned over the deployment of U.S. national missile defense and theater missile defense for its allies. China might feel compelled to upgrade its nuclear and missile capabilities, which would ultimately generate compensating actions in India and Pakistan, resulting a new arms race with potential repercussions beyond South Asia.

Both India and Pakistan would have incentive to exploit deteriorating relations between the United States and China. New Delhi would seek closer relations with Washington while maintaining cooperative ties to Beijing; Islamabad would seek to cement ties with China, while maintaining cooperative relations with Washington. However, from Pakistan's perspective, the deterioration of U.S.–China ties would not be welcome; nor is it considered necessary. China is not a warrior state, rather, it is a trading state, committed to a policy of modernization and accumulation of trade surpluses to fuel economic growth. China receives US$ 40 billion in foreign direct investment annually, mostly from the United States, and enjoys nearly a US$ 100 billion annual trade surplus with the United States. China's economic interests are paramount; unless sorely provoked, Beijing is not going to engage in warfare with the United States.[13]

New Delhi makes it clear,

> given its size, geographical location and trade links, India's security emolument ranges from the Persian Gulf to the Strait of Malacca across the Indian Ocean, including the Central Asian region in the northwest, China in the northeast, and Southeast Asia.[14]

For India to achieve these ambitions, it must do so by diminishing the role of other powers. This would, in turn, require the fulfillment of ambitious plans to extend its naval power. India has conducted naval

exercises with Vietnam, Japan, South Korea, Indonesia, and Singapore, all of whom have strong reservations about China. On the other hand, China regards the Asia-Pacific region as vital to its security, and any Indian attempt to intrude into the region will face Chinese resistance.[15]

India, Pakistan, and China are very far from the stabilizing conditions fixed by the superpowers in the Cold War era.[16] All three states share "lines of actual control" instead of international borders. Under these conditions, the introduction of missile defenses will play a destabilizing role. India, which seeks to be the beneficiary of the U.S. pursuit of missile defenses, could instead find itself under increased threat from its two immediate neighbors. In response to Indian acquisition of missile defenses, China and Pakistan are likely to engage in nuclear buildups and to continue established patterns of strategic cooperation. Moreover, New Delhi's deployment of missile defenses could jeopardize improved relations between India and China. Pakistan's perception that India seeks to counter its nuclear deterrent could also make the resolution of the Kashmir dispute more remote. In addition, India's social and economic development might be adversely affected if funding for missile defenses is added to military expenditures, which have already risen by double-digit percentages in 2000 and 2001.[17] The deteriorating security environment in South Asia resulting from Pakistani and Chinese reactions to Indian missile defense deployments could also prompt New Delhi to push closer to weaponizing and deploying its nuclear forces.

Both supporters and opponents of ballistic missile defense in the United States claimed that the events of September 11, 2001 strengthened their case. Supporters argued that the attacks on the World Trade Center and Pentagon demonstrated the need for protection against unexpected but devastating threats, while opponents noted that terrorists do not need ballistic missiles to carry out such attacks; knives and box cutters were sufficient to perpetrate these terrible crimes. If strongly held views in the United States over missile defenses were not changed by the September 11 attacks, it is reasonable to expect that strongly held views in Pakistan on this subject are unlikely to change as a result of reassuring statements emanating from Washington or New Delhi. Many Pakistanis view missile defense advocacy in the United States as an obsession that will detract from higher priority efforts against terrorism, and impair U.S. cooperation with Russia and China.

CONCLUSION

Many Pakistanis view Washington's pursuit of missile defense as serving the wider purpose of assuring U.S. military and political dominance. As a consequence of this pursuit of unchallengeable power, Washington risks stimulating an arms race in southern Asia. Just as Russia and China view ballistic missile defense to be directed at them, Pakistan would view the induction of missile defense by India as an attempt to neutralize Pakistan's deterrent. The distinction between theater and national missile defense therefore becomes blurred in South Asia.

From Pakistan's perspective, a transition from nuclear offense to missile defense is both unlikely and very destabilizing. It is unlikely because India is not going to give up its nuclear deterrent. It is destabilizing because the addition of missile defenses to India's deterrent force would be viewed in Pakistan as an attempt to nullify Pakistan's deterrent. Therefore, India's interest in missile defenses would upset the strategic balance in South Asia and generate regional instability and nuclear and missile buildups.

These unfortunate repercussions would also take place at the international level. Missile defense deployments are very expensive, making it difficult for other states to follow the example of the United States and its strategic allies. An international environment that is divided between states enjoying the presumed protection of missile defenses and states that are under a greater threat would be inherently unstable.[18] National missile defense deployments by the United States would be viewed by Russia and China as weakening their nuclear deterrents, prompting increased requirements for Russian and Chinese nuclear forces. Russia, which was prepared to give up deployments of multiple, independently targetable reentry vehicles on land-based missiles, would need to reconsider this posture. China, which has abstained from deploying multiple-warhead missiles, would also need to move in this direction. Alternatively, or in addition, the option of increasing missile production rates would be considered. Furthermore, states that have refrained from maintaining nuclear forces at high levels of readiness—or states that wish to take missiles off "hair-trigger" alert—would have to reconsider this posture in light of missile defense deployments.

In southern Asia, the negative repercussions of ballistic missile defense deployments would be particularly acute. The bulk of China's nuclear arsenal is missile-based, and both India and Pakistan are relying increasingly on missile-based nuclear deterrents. U.S. deployments of missile defenses and transfers of missile defense technology would surely lead to further missile proliferation in China, India, and Pakistan. U.S. national missile defenses would encourage Beijing to enlarge its nuclear arsenal, which could prompt New Delhi and, in turn, Islamabad, to follow suit.[19]

Missile defense is not a substitute for disarmament. Nor is it a substitute for arrangements for nuclear stability in South Asia. To the contrary, the prospective deployment of missile defenses makes these efforts more difficult. As Lt. Gen. (retd.) Talat Masood has said, "if the United States [decides to deploy] missile defense, then it should *complement* the process of disarmament."[20] This complementary process will be hard to pursue at the global level, and even more difficult to carry out in South Asia.

Notes

1. An earlier version of this essay was originally published in Michael Krepon ed., *The Impact of U.S. Ballistic Missile Defenses on Southern Asia*, report no. 46 (Washington, DC: The Henry L. Stimson Center, July 2002), 21–28.
2. "Stance on U.S. Missile Plan Based on Principle: Zhu's Visit Not to Affect Ties With Donors: Sattar," *Dawn* (Pakistan) (May 16, 2001).

3. Syed Talat Hussain, "Chinese Role Key to South Asian Peace: CE Seeks Help to Maintain Deterrence," *Dawn* (Pakistan) (May 16, 2001).
4. See Michael Green and Toby Dalton, "Asian Reactions to U.S. Missile Defense," *NRB Analysis* vol. 11, no. 3 (Washington, DC: The National Bureau of Asian Research, 2000).
5. Brad Roberts, "Appendix A: China and BMD: Perspectives and Likely Reactions," *China-U.S. Nuclear Relations: What Relationship Best Serves U.S. Interests?* Prepared for the Advanced Systems and Concepts Office of the Defense Threat Reduction Agency (August 2001), A20–A27.
6. U.S. National Intelligence Council, *Foreign Missile Developments and the Ballistic Missile Threat Through 2015* (December 2001), Internet: http://www.odci.gov/nic/pubs/index.htm.
7. Steve La Mantague, "NMD Will Slow India's Rise," the *Hindu* (India) (June 13, 2001).
8. Gaurav Kampani, "How a U.S. National Missile Defense Will Effect South Asia" (Monterey, CA: Center for Non-proliferation Studies, Monterey Institute of International Studies, May 2000), 6.
9. Achin Vanik, the *Hindu* (India) (May 25, 2001), Internet: http://www.hinduonnet.com/thehindu/2001/05/25/stories/05252524.htm.
10. Irfan Hussain, "The winds of change," *Dawn* (Pakistan) (May 18, 2001).
11. Maqbool Ahmed Bhatti, "New Phase in Pak–China Relations," *Dawn* (Pakistan) (May 25, 2001).
12. Imtiaz Alam, "The Strategic Shift," *The News* (Pakistan) (May 18, 2001).
13. Najam Sethi, "Leaf from China," *The Friday Times* (Pakistan) (May 21, 2001).
14. Ibid.
15. See ASEAN Regional Forum, *2nd Volume of the Annual Security Outlook (ASO) 2001* (2001), Internet: http://www.aseansec.org/menu.asp?action=3&content=2.
16. Michael Krepon, "Nuclear Risk Reduction: Is Cold War Experience Applicable to Southern Asia?" in Michael Krepon and Chris Gagne eds., *The Stability–Instability Paradox: Nuclear Weapons and Brinkmanship in South Asia* report no. 38 (Washington, DC: The Henry L. Stimson Center, June 2001), 1–14.
17. India increased defense spending by 28 percent in FY2000 and again by 13 percent in FY2001. "India Boosts Defence Spending," *BBC News* (February 29, 2000), Internet: http://news.bbc.co.uk/hi/english/world/south_asia/newsid_660000/660225.stm and Rahul Bedi, "India Increases Spending to Replace Old Weapons," *Jane's Defence Weekly* (March 7, 2001), Internet: http://www.janes.com/defence/news/jdw/jdw010307_2_n.shtml; The defense budget was increased by 4.8 percent in FY2002. "India Unveils Annual Defence Budget," *BBC News* (February 28, 2002), Internet: http://news.bbc.co.uk/hi/english/world/south_asia/newsid_1845000/1845874.stm.
18. Dipanker Banerjee, Executive Director, Regional Centre for Strategic Studies (Colombo), interview with author (June 20, 2001).
19. Waheguru Pal Singh Sindhu, "Regional Perspectives South Asia," *International Missile Proliferation and Defenses* Occasional Paper no. 5 (Monterey, CA: Monterey Institute of International Studies, Center for Non Proliferation, March 2001), 61–62.
20. Lt. Gen. (Retd.) Talat Masood, interview with author (italics added) (June 24, 2001).

11

Missile Defense and Strategic Modernization in Southern Asia

Arvind Kumar

Reactions to U.S. missile defense programs differ among Asia-Pacific nations depending not only on the system to be deployed—that is, theater missile defense (TMD) or national missile defense (NMD)—but also depending on their relationship with the United States, their specific security situation, and their perceptions of how missile defenses will change the balance of power in the region.[1,2] It is widely perceived in India that U.S. ballistic missile defense (BMD) is not restricted to rogue states or states of concern, but is intended to tackle the entire range of threats that the United States might face in the future.

Indian perspectives on U.S. ballistic missile defense initiatives are varied and fluid. In an interview on July 24, 2000, Jaswant Singh stated,

> We have consistently held a view that opposes the militarization of outer space. The National Missile Defense will adversely influence the larger movement towards disarmament of which India is a staunch advocate. We believe that technological superiority will result in a reaction in other parts of the world, thus reviving the possibility of yet another, and newer, arms race. We can not support this development.[3]

The tone of this statement was quite different from the Ministry of External Affairs (MEA) press release within 24 hours of President Bush's address at the National Defense University on May 1, 2001. The press release stated,

> India, particularly, welcomes the announcement of unilateral reductions by the U.S. of nuclear forces, as an example. We also welcome moving away from the hair-trigger alerts associated with prevailing nuclear orthodoxies. India believes there is a strategic and technological inevitability in stepping away from a world that is held hostage by the doctrine of mutual assured destruction to a cooperative, defensive transition that is underpinned by further cuts and a de-alert of nuclear forces.[4]

However, if one goes through the MEA press release carefully, it is obvious that India has not supported U.S. intentions to deploy ballistic missile defenses. Media accounts have drawn the erroneous conclusion that India has supported and welcomed BMD because the press release does not specifically criticize it.

Even though New Delhi understands the predicament of the United States, there is a sharp division within the strategic community in India about U.S. BMD deployments. Some think that India should not worry much because BMD has no direct linkage or relevance to its security structure since India does not pose a strong military threat to U.S. interests in Asia. Others think that U.S. BMD deployments might create imbalances and jeopardize regional security. On the one hand, BMD signals a choice to resolve a defense dilemma by defensive, rather than offensive, means. On the other hand, introducing a defensive system could upset the security balance in ways that offensive systems do not, by giving the possessor of missile defense the ability to attack first and then defend against retaliation.

Some in India link the issue of U.S. BMD deployment with the prevailing notion of nuclear deterrence theory. It is generally argued that the notion of nuclear deterrence might become irrelevant once the United States achieves effective missile defenses. For example, China's 20 or more intercontinental ballistic missiles (ICBMs) might be negated because the United States would be able to prevent ICBM warheads from reaching their intended targets and, therefore, a Chinese second strike would not produce the desired result. The possession of NMD technology grants more freedom to attack and freedom from attack. To compensate, there is a high likelihood that China might develop some countermeasures that would help it evade NMD. China would also like to attain NMD technology in the future, which would, in turn, weaken the nuclear deterrent of India.

In the prevailing scenario, U.S. BMD deployment is not meant for either Russia or China. The Bush administration has said that it seeks to deploy a limited NMD system against potential missile threats from rogue states or an unauthorized or accidental launch. China and Russia wonder whether U.S. BMD might instead be directed against them, and have been the strongest opponents. Despite their opposition, the United States has been trying to convince China and Russia otherwise and create an atmosphere of trust and confidence. The rationale behind the need for missile defense deployments has been articulated to Russia and China through a series of dialogues. U.S.–Russia and U.S.–China relations have mostly been driven by economic and commercial interests. China and the United States have some differences, but their common interests are greater.[5] It is commonly understood in China that a major political confrontation with the United States would undermine the broader international environment that is the basis for China's economic modernization.

The linkage between U.S. missile defense deployments and the Anti-Ballistic Missile (ABM) Treaty has become a major issue in the debate in India and abroad. During the Cold War, the ABM Treaty was a crucial

cornerstone in maintaining balance and stability. Now, many fear that U.S. BMD deployments might not contribute to global stability, and instead might trigger an arms race.

India believes that the United States would deploy a technically feasible NMD, taking into account its national security requirements, despite global reactions to it in general and from Russia and China in particular. There is a fear that the United States would threaten the whole architecture of nuclear disarmament and nonproliferation by deploying missile defenses. This essay examines the possibilities of such an action–reaction cycle in South Asia.

China would start questioning its deterrent posture vis-à-vis the United States once Washington deploys a technically feasible NMD, as its second-strike capability could be rendered obsolete. U.S. NMD deployment could cause China to increase its number of ICBMs. China might also try to acquire or refine technologies to evade limited NMD. An increase in the number of Chinese ICBMs in response to U.S. NMD would likely have at least a limited effect on India's force structure.

China's Strategic Modernization

Many members of the strategic community around the world believe that U.S. NMD and TMD deployments would have a series of far-reaching consequences for the international security environment. The U.S. NMD program, for example, would jeopardize the global strategic balance and stability and undermine mutual trust and cooperation among major powers.

The United States, as of now and despite several pronouncements to the contrary, has not slowed down its modernization of nuclear forces. According to the "Nuclear Notebook" in the *Bulletin of the Atomic Scientists*, the modernization of U.S. nuclear forces continues, with upgrades underway to all major nuclear weapon systems.[6] The Minuteman III ICBM is in the middle of a multi-billion dollar modernization program, four Pacific-based strategic submarines are being upgraded from Trident I to the longer-range and more accurate Trident II missiles, a new "modified" Trident II missile is under development, and the air force has begun development of a new strategic bomber. The Notebook discloses that although the B-1 bomber is widely reported to have been converted to a conventional-only role, the U.S. Air Force maintains plans under which the aircraft can quickly be returned to nuclear roles. The Notebook also reveals that some of the new Joint Strike Fighters currently under development by the Pentagon will be equipped to deliver nuclear bombs. Finally, after a pause of nearly a decade, the United States has resumed production of new plutonium cores for nuclear warheads.[7]

It seems as if the modernization of U.S. weaponry will never stop, even if it acquires a technically feasible BMD capability. The same logic applies to China. U.S. BMD is not to blame because China has been involved in its strategic modernization program for years. China will be modernizing existing arsenals both in the nuclear and missile field whether or not the United

States deploys BMD. Beijing has not offered a commitment to stop its strategic modernization program if the United States would not deploy BMD.

There is a considerable debate in the United States and India about China's current strategy and whether it has moved from minimum deterrence to "limited" deterrence, implying the need for a more substantial operational capability. Its 20 or so nuclear-equipped ICBMs could never compete with the thousands of weapons in the U.S. and Russian inventories. However, China still, in the current context, has the potential to deter both the United States and Russia.

China's decades-long modernization efforts reflect its longstanding concern about the survivability of its nuclear deterrent and retaliatory force. This concern has intensified over the last decade, as the United States has demonstrated a dramatic improvement in conventional, long-range, precision-strike capability. China is widely reported to be trying to improve the range, payload, and accuracy of its existing missile forces. There has certainly been an increase in the number of Chinese missiles and in China's deterrent capability against U.S. allies in East Asia, in particular Taiwan and Japan.

China has land-, air-, and sea-based nuclear capabilities, but it is widely reported and believed that its sea- and air-based components have little or no intercontinental capability. China's ballistic missile force consists overwhelmingly of short- and intermediate-range missiles that are either dual-capable or armed with conventional warheads. These missiles are constructed primarily to deal with Chinese security requirements around its periphery.[8] Some analysts believe that China has developed and deployed a wide range of tactical nuclear weapons to support its conventional forces in combat.[9] China continues to modernize its overall inventory of nuclear weapon systems, which now includes over 100 warheads deployed operationally on medium-range ballistic missiles (MRBMs) and ICBMs. China is not currently believed to be producing fissile material for nuclear weapons, but has a stockpile of fissile material sufficient to increase or improve its nuclear inventory.[10]

With its successful test of the DF-31 missile, China is now moving to deploy a new generation of road-mobile, solid-fueled, long-range ICBMs capable of reaching targets across the U.S. west coast. As a part of its modernization program, China has also been pursuing an effort to develop the capability to deliver multiple warheads to different targets from a single ballistic missile. China's "targetable" program for acquiring multiple independently targetable reentry vehicle (MIRV) capability dates back to 1970 and received a boost from the Chinese Government in 1983 following U.S. President Ronald Reagan's announcement of the Strategic Defense Initiative.[11] Missile tests undertaken in the mid-1980s may have been intended for the development of multiple-warhead missiles, including one such test for the DF-5 ICBM.[12]

An unclassified version of the September 1999 U.S. National Intelligence Estimate stated:

> China has had the technical capability to develop multiple reentry vehicle (MRV) payloads for [twenty] years. If China needed a MRV capability in the

near term, Beijing could use a DF-31-type RV to develop and deploy a simple MRV or MIRV for the CSS-4 in a few years.[13]

The U.S. Intelligence Community and an independent panel of U.S. experts (the Jeremiah Commission) offered a similar perspective in April 1999 after a detailed investigation into China's capabilities.[14] A U.S. House of Representatives Select Committee, led by Rep. Christopher Cox also issued a report, which stated that the Peoples' Republic of China (PRC) "has demonstrated all of the techniques that are required for developing a MIRV bus," and that "the PRC could develop a MIRV dispensing platform within a short period of time after making a decision to proceed."[15] The Cox Committee report asserts that China has the potential to acquire MIRV capability but the decision in this regard has yet to be taken by the Chinese Government. As of December 2001, the U.S. Intelligence community projects that Chinese ballistic missile forces will increase several fold by 2015, although it will remain still well below the number of Russian or U.S. forces. MIRVing and missile defense countermeasures would be factors in the ultimate size of the force. In addition, China would have about 24 short-range DF-31 and CSS-3 ICBMS that could reach parts of the United States.[16]

As part of its modernization program, China is developing its submarine capabilities as a sea denial force. A new nuclear submarine (SSN) designated Type 093 is under development, displacing 6,000 tons and capable of carrying torpedoes, anti-ship missiles, and land-attack cruise missiles (LACMs). Based on the Russian Victor III-class boat, the Type 093 will be a substantial improvement in China's anti-submarine warfare and anti-ship capability. China is also developing the Type 094 nuclear-powered ballistic missile submarine (SSBN) as a replacement for its single Xia-class SSBN. These boats will carry the more advanced JL-2 submarine-launched ballistic missile (SLBM), which will be capable of carrying MIRV warheads and have a considerably longer range than the older JL-2.

A comprehensive and correct analysis of China's strategic capabilities and its modernization program is a very difficult task for the simple reason that China maintains military secrecy over virtually all information relating to its national security. The problem lies not only with China's lack of transparency, but also with concealment and deception, which appear to be the hallmark of Chinese policies regarding nuclear weapons and missiles. The analysis and the conclusions here are essentially based on data available in the public domain.[17]

China's Response to BMD

While there is no dispute that the prospect of U.S. missile defense deployments is deeply troubling to Beijing, China may be using U.S. plans as a justification for its modernization program. As Ambassador Sha Zukang, the former director of the Department of Arms Control and Disarmament in the Foreign Ministry, has argued, NMD "will only poison the atmosphere, undermine the conditions necessary for nuclear disarmament, and also breed

a potential danger of an arms race."[18] China has already declared a number of times that it would be increasing its arsenal of ICBMs.[19] From China's point of view, effective U.S. missile defense capabilities pose the prospect of living in a world in which Washington could dictate terms to China anywhere Washington has an interest, whether in the service of Taiwan's independence or human rights in Tibet. Therefore, TMD or NMD deployments by the United States present China with both an operational military challenge and a political threat. Chinese experts also argue that international stability cannot survive for long in a world in which any one power has the means to dictate to the rest. Theater missile defense and national missile defense are seen as part of a strategy of unilateral hegemony, which would allow the United States to intervene anywhere with impunity.

China believes that the United States does not need missile defenses to protect itself from North Korean missiles, and views BMD as part of a strategy to allow the United States to launch a first-strike against Chinese nuclear weapons and then to use missile defenses to minimize the damage from a retaliatory strike. In reaction to this scenario, China recently announced its intention to spend an additional $9.7 billion to upgrade its nuclear forces modernization program and to prepare for "a vigorous counterattack once hegemonists and their military alliance use nuclear weapons to make a surprise attack on China."[20]

A report prepared by the U.S. Central Intelligence Agency states that China "views the probability of war to be declining with Russia, India, and Vietnam, increasing with the [United States] and Japan, and ever present with Taiwan and South China Sea regional states."[21] The People's Liberation Army has already warned Taiwan and has asked it not to join a cooperative missile defense program with the United States and Japan. The PRC's official military newspaper *Liberation Army Daily* said that Taiwan President Chen Shui-bian has been "playing with fire" by seeking a military alliance with these two nations.[22]

It is obvious from the Chinese actions that the end of the Cold War refocused Chinese military planning from the Soviet Union to the United States. Chinese planners focus on the threat of conflict over Taiwan. It is widely believed in China that attaining advanced missile capabilities is the only means to provide leverage to secure its goals with respect to Taiwan, without an actual invasion. Beijing apparently sees short-range missiles as useful for political coercion, and, if necessary, for defeating Taiwan's military forces, while its long-range missiles induce restraint by the United States.[23]

Chinese experts appear to be less concerned about TMD in Japan or South Korea than in Taiwan. China's primary concern about TMD cooperation between the United States and Taiwan is not so much operational as political, as China believes Taiwan to be an integral part of its territory.[24] Operationally, the PRC has the ability to overwhelm proposed missile defenses with the deployment of an even larger number of missiles, especially if equipped with the technical aids helpful for penetrating defenses. Politically, China fears that Taipei would interpret such cooperation as a

de facto restoration of the mutual defense treaty and as a further source of encouragement to move toward formal independence.[25] Some Chinese analysts also speculate about the possible use of U.S. TMD as an NMD capability. The prospect of U.S. deployment of both TMD and NMD only amplifies Chinese concerns about coercion at the hands of the United States.

In response to U.S. missile defenses, China might decide to put its missiles on hair-trigger alert. In this case, China would need to launch its nuclear weapons after it detects a nuclear attack but before incoming nuclear weapons arrive. This strategy is called "launch-on-warning" and was cited as a reason for not having to fear prospective missile defense deployments by American negotiators in their consultations with Russia over the ABM Treaty.[26] This approach requires advanced and reliable early warning systems, which China does not yet possess, but will work hard to acquire.

China is also likely to respond to a U.S. NMD system by deploying more of its own ICBMs and by developing more sophisticated countermeasures. Indian strategic analysts expect that China would be compelled to counter the deployment of U.S. BMD by expanding and accelerating development in the field of sophisticated and long-range missiles and it might seek a more substantial capacity to overwhelm BMD with both conventional and nuclear missiles. It is anticipated that even a limited NMD with 100 interceptors would be able to neutralize China's minimal deterrent capability, which is based on its possession of 20 or so old, liquid-fueled DF-5 ICBMs. Consequently, China might accelerate the development of its mobile, solid-fueled, 6,500 nautical mile DF-41 ICBMs.

China might also use and improve its existing stealth technology to evade NMD systems. Stealth technology can be used to make warheads less observable. For example, the radar reflection of a warhead can be reduced by putting the warhead in a reentry vehicle with a pointed cone-sphere shape, or by painting the reentry vehicle with radar-absorbing materials. This countermeasure is based on fairly uncomplicated technology and can reduce the effectiveness of defenses. The only countermeasure so far mentioned by the Chinese defense industry is the use of a maneuvering warhead.[27] The maneuvering capability of the warhead should be superior to that of the interceptor.

Despite its concerns over U.S. missile defenses, China would never repeat the mistakes committed by the former Soviet Union during the Cold War period. China's high priority is in the field of economic development. This view has been confirmed by the Pentagon's June 2000 report to Congress on Chinese military power, which explicitly states

> Beijing places top priority on efforts to promote rapid and sustained economic growth, to raise technological levels in science and industry, to explore and develop China's land- and sea-based national resources and to secure China's access to global resources.[28]

In the age of globalization, the Chinese leadership sees a strong economy as the main ingredient in what they call comprehensive national power. Although

China's priorities will focus on developing its economy and raising the income and living standards of its citizens, Beijing's nuclear modernization will certainly have an impact on the Asia-Pacific region.

It is highly likely that Beijing would become more belligerent and less cooperative on a number of issues that matter to Washington once the United States deploys NMD. There is also a possibility that China would refuse to cooperate on non-proliferation matters and become more inclined to sell nuclear and ballistic-missile technology to other countries. China has already been engaged in such activities in a clandestine manner. Analysts in China feel that the Chinese export control policies are not rigid. They could be amended to suit national interests and attain strategic objectives.[29]

Impact on India's Force Structure

China's strategic modernization programs will certainly have wide ramifications in South Asia, particularly on India's force structure. China is collaborating with Pakistan by supplying both nuclear and missile technologies as well as sharing technical expertise. Hence, Beijing's strategic modernization program will have an impact on New Delhi. Pakistan stands to gain from China's strategic modernization programs. China might provide Pakistan with actual weapons and missiles during wartime scenarios in the Indian subcontinent. In order to make its presence felt in the region and act as a "hegemon," China may have already transferred fully deployable systems to Pakistan. With the increase in China's force structure, it may become easier for Pakistan to increase the size, sophistication, and overall capability of its strategic force. Hence, India cannot dismiss Pakistan in formulating its strategies and policies. Nevertheless, while India has more immediate problems with Pakistan than China, these problems arise because China continues to collude with Pakistan, using it as a counterweight to ensure that India is kept distracted by a proxy war.

The Kashmir issue is unlikely to be resolved in the near future because, for India, it is not a core issue, but one that Pakistan has unnecessarily inflated. Pakistan's desire to keep Kashmir on the boil will remain. India also fears that China will continue to harbor hegemonic ambitions. The Sino-India Joint Working Group on border issues has not been able to decide on the Line of Actual Control for more than a decade. It also seems very unlikely that China will give up its claim on regions such as Arunachal Pradesh in India. Hence, in the prevailing environment, the possibility of a Sino-Indian confrontation cannot be discounted. The assessment done by Indian Defense Minister George Fernandes in 1998, and public declarations about Chinese intentions and behavior across Indian borders might prove true.[30]

At present, there are divisions within India regarding its own nuclear policy. Moderates support the concept of a minimal and de-alerted nuclear force in the low hundreds and oppose further nuclear tests. Moderates also support India's ratification of the Comprehensive Test Ban Treaty and eventual accession to a multilaterally negotiated Fissile Material Cut-off Treaty.[31]

Hardliners, on the other hand, favor a posture with a triad nuclear force comprised of 400 to 1,000 nuclear warheads. This group advocates the resumption of nuclear testing to develop lighter, thermonuclear, and enhanced radiation warheads for a potential MIRVed ballistic missile force. Hardliners are skeptical of the value of a fissile material cut-off.[32]

There is a third group of "hard-headed liberals."[33] This group suggests that India should not imitate any other country with regard to the development in nuclear and missile technologies, but rather, should articulate its requirements based on a careful assessment of threat perceptions. This group recommends that India should have a triad capability because India adheres to a no-first-use policy and sea-based assets are required for a survivable second-strike capability. Adherents to this view strongly advocate that India should be adequately prepared for war in order to ensure peace in the region. A fourth group argues that India does not need nuclear weapons for its security requirements.[34]

India's security will be adversely affected by the action–reaction cycle. U.S. and Russian nuclear capabilities drive China's strategic modernization program, which ultimately triggers increased deterrent requirements for India. India's nuclear tests in 1998 prompted President Bill Clinton to declare that nuclear-weapon capability "is not necessary to peace, to security, to prosperity, to national greatness or personal fulfillment," but on the North Atlantic Treaty Organization's 50th anniversary, the alliance adopted a new security concept that still found U.S. nuclear weapons "vital to the security of Europe."[35] Statements such as these have led India to denounce the Non-Proliferation Treaty (NPT) as "nuclear apartheid." Under the prevailing circumstances India will not agree to forego its strategic options unless the same remedy is applied to the entire international structure, including the United States, Russia, and China. It is, however, strongly believed among strategic thinkers in India that nuclear weapons are not usable war-fighting instruments. Rather, the possession of nuclear weapons makes other major powers moderate their behavior and limits the nature of any conflict between states possessing nuclear weapons.

It is most likely that India pursues the manufacture of a limited number of intermediate-range ballistic missiles (IRBMs) on a priority basis. As of now, India's IRBM is in the development stage. For an effective, credible, minimum nuclear deterrent, India needs IRBMs with ranges between 3,000–5,000 kilometers to contain threats from China. Military analysts and government officials feel that India will probably field a modest nuclear force in the low hundreds. Most analysts feel that India does not need intercontinental ballistic missiles (ICBMs) because India does not need to reach beyond China. Hence, India should not be influenced by the Chinese possession of ICBMs.

Because India's nuclear posture is defensive and reactive, India certainly would need land-based missiles, aircraft, and possibly sea-based assets, as envisioned in the draft Indian nuclear doctrine.[36] A triad is required because aircraft and land-based missiles can be vulnerable to a first strike. To complement the no-first-use policy and maintain a second-strike capability,

sea-based assets are an essential component of India's proposed force structure. Currently, India has a program to develop indigenous sea-based assets at a much faster pace than in the past. India is likely to continue conducting missile tests to validate delivery systems for its nuclear deterrent while exercising strategic restraint.[37] Indian short-range ballistic missiles (SRBMs), such as the Prithvi, are likely to be improved with technological advancements. Within the Indian subcontinent, Pakistan first introduced different types of missiles on the battlefield.[38] India began to examine seriously SRBMs only after their use in the Iran–Iraq War and Pakistan's subsequent interest in them.

India's defense concerns will largely be confined to southern Asia. Changes in China's nuclear capabilities will force India to reexamine its definition of a minimum nuclear deterrent. India's aspirations in the field of missiles and nuclear weapons are in large part a response to China's capabilities and intentions. In the existing milieu, Indian nuclear requirements will be sized against China; this should also be sufficient to cover targets in Pakistan. Viewed in this context, Indian planners might concentrate on achieving long-range IRBMs to have a second-strike capability against China. India need not pursue an ICBM capability despite the technological potential for making such missiles. The defense strategy for India should be China-specific while also taking into account Pakistan's actions.

The military capability of any nation is critical to deterrence, whether it is conventional or ballistic missiles tipped with nuclear warheads. India would surely take China's total force structure into account in developing a strategy to enhance its existing capabilities. If a credible nuclear deterrent is in place with respect to China, then conventional war-waging capabilities of India, even if inferior to China, could be exploited to their full potential. This simply means that once India acquires a nuclear deterrent against China, there will always be a feeling of strength and these feelings would, in turn, boost the potential of conventional weaponry even if inferior to China—just as Pakistan's nuclear status has given an unseen strength to its conventional forces.

India's draft nuclear doctrine clearly highlights that India will not be the first to initiate a nuclear strike, but will respond with punitive retaliation should deterrence fail. India's no-first-use policy has a strong linkage to U.S. interests in missile defenses because both are defensive measures that could complement each other. There is deep compatibility with these two notions. For the Indian nuclear doctrine to produce deterrence, the stated weapons must be seen to be ready, the platforms ready, the weapons mated, and the command, control, communication, and intelligence (C^3I) for their use in place. The required elements for an effective, credible, minimum nuclear deterrent are not now in place. India should keep its deterrent ready but must not deploy it.

India's Response to BMD

India is concerned about China acquiring a BMD capability. If China develops a BMD capability indigenously and shares it with Pakistan, it would place

India's force structure and its deterrent capability against both Pakistan and China in a precarious condition. India has been very concerned with China's clandestine nuclear and missile assistance to Pakistan, which is basically aimed at offsetting Indian technological advances and tying India down by building a counterweight. Another major disturbing factor for India is China's ability to target any city in India while India cannot target most of China. In this sense, India's lack of a missile-based deterrent force vis-à-vis China constitutes the biggest weakness in Indian defenses today. Chinese missile defenses would exacerbate this problem.

The possibility of U.S.–Pakistan cooperation in the field of missile defenses might also emerge as a major Indian concern. Pakistan's support for United States in the war in Afghanistan could reopen the military supply relationship, including the provision of ballistic missile defenses. There is a need for the United States to clearly articulate its interests in Asia and the nature of its bilateral relationships. For now, India understands that the United States wants to enlist very selectively Japan, South Korea, and Israel on BMD technologies.

Conclusion

Indian concerns regarding BMD would be assuaged as long as China is not able to develop missile defenses and the United States does not provide Pakistan with BMD technology. The prospect of missile defense deployments by the United States, at both theater and national levels, intensifies Chinese concerns about their deterrent capabilities. Undoubtedly, the extent of China's strategic modernization program will have an effect on India's security. However, India might not be greatly affected by an increase in the number of Chinese ICBMs because China's threat perceptions are different from those of India. China, as of now, has the capability to target any Indian city, while India lacks credible nuclear deterrence against China. India will concentrate primarily on acquiring a credible minimum nuclear deterrent against China, and hence, might pursue its IRBM (Agni-III) program vigorously. In addition, India is likely to pursue nuclear-powered submarines at the earliest to have a second-strike capability. It is also likely that India, in coming years, will acquire national technical means to keep track of Chinese missiles and pinpoint their locations.

India is not reassured by China's no-first-use guarantee, nor its claims that its nuclear arsenal is purely defensive and not on hair-trigger alert, because of the lack of transparency in China and the absence of reliable warning systems in India. India is likely to face indirect threats from China in terms of its continuing ties with Pakistan and is concerned about the future of China–Pakistan collusion with regard to nuclear- and missile-related technologies. India needs a better sense of Chinese behavior and intentions, which would, in turn, help India to shape its strategies and plan its force structure. At the same time, India will continue to campaign for a nuclear weapon-free world. India's mention of nuclear disarmament in its draft nuclear doctrine is a case in point.

NOTES

1. The author wishes to acknowledge his senior colleagues Prof. Roddam Narasimha, Director, National Institute of Advanced Studies (NIAS); Prof. S. Rajagopal, Homi Bhabha Visiting Professor, NIAS, Bangalore; and Prof. Michael Krepon, Founding President, The Henry L. Stimson Center, for their comments and suggestions. Their comments helped in conceptualizing and refining the paper. The author also wishes to thank Chris Gagné, Research Associate at The Henry L. Stimson Center, for editing the paper. An earlier version of this essay was originally published in Michael Krepon and Chris Gagné eds., *The Impact of US Ballistic Missile Defenses on Southern Asia*, report no. 46 (Washington, DC: The Henry L. Stimson Center, July 2002), 29–44.
2. Michael J. Green and Toby F. Dalton, "Asian Reactions to US Missile Defense," *NBR Publications: NBR Analysis* vol. 11, no. 3 (November 2000), Internet: http://www.nbr.org/publications/analysis/vol11no3/index.html.
3. Interview with *Times of India* (July 24, 2000); also quoted in Indian weekly *Outlook* (India) (May 2001).
4. Ministry of External Affairs, Press Release (May 2, 2001).
5. Chinese Foreign Ministry Spokesman Sun Yuxi stated this on (November 8, 2001).
6. Robert S. Norris and William M. Arkin, "NRDC Nuclear Notebook," *Bulletin of Atomic Scientists* (January/February 2001).
7. Ibid.
8. Robert A. Manning, Ronald Montaperto, and Brad Roberts, *China, Nuclear Weapons, and Arms Control: A Preliminary Assessment*, Chairmen's Report of a roundtable jointly sponsored by the Council on Foreign Relations, National Defense University, and the Institute for Defense Analyses (Washington, DC: Council on Foreign Relations Press, 2000), Internet: http://www.cfr.org/public/resource.cgi?pub!3601.
9. Information on Chinese tactical nuclear weapons is limited and contradictory and there is no confirmation from official sources of their existence. See research by Center for Non-Proliferations Studies available on the Nuclear Threat Initiative website, Internet: http://www.nti.org/e_research/e1_china_1.html; Robert S. Norris and William M. Arkin, "NRDC Nuclear Notebook: Chinese Forces 1999," *Bulletin of Atomic Scientists* vol. 55, no. 4 (May/June 1999); and You Ji, "Nuclear Power in the Post-Cold War Era," *Comparative Strategy* vol. 18, no. 3 (July–September 1999): 246–48.
10. David Albright, Frans Berkhout, and William Walker, "Plutonium and Highly Enriched Uranium 1996: World Inventories, Capabilities and Policies," *SIPRI* (Oxford: Oxford University Press, 1997).
11. James A. Lamson and Wyn Q. Bowen, "'One Arrow, Three Stars': China's MIRV Programme," *Jane's Review* (May/June 1997), 216–18, 266–68.
12. Manning et al., *China, Nuclear Weapons, and Arms Control*, 24.
13. U.S. National Intelligence Council, "Foreign Missile Developments and the Ballistic Missile Threat to the United States Through 2015" (September 1999), Internet: http://www.odci.gov/nic/pubs/index.htm.
14. U.S. National Intelligence Council, "Key Findings" of *The Intelligence Community Damage Assessment on the Implications of China's Acquisition of U.S. Nuclear Weapons Information on the Development of Future Chinese Weapons* (April 2, 1999), Internet: http://www.cia.gov/cia/public_affairs/press_release/archives/ 1999/0421kf.html.

15. U.S. House of Representatives Select Committee on US National Security and Military/Commercial Concerns with the People's Republic of China, *US National Security and Military/Commercial Concerns With the People's Republic of China*, Internet: http://www.house.gov/coxreport/.
16. U.S. National Foreign Intelligence Board, "Foreign Missile Developments and the Ballistic Missile Threat Through 2015," Unclassified Summary of a National Intelligence Estimate (2002).
17. Federation of American Scientists, "China Nuclear Forces Guide," Internet: http://www.fas.org.
18. Benjamin Kang Lim, "China Rejects US Anti-missile Defence Plans," *Reuters* (November 24, 1999).
19. Chinese Ambassador Sha Zakang has made such statements both in media and conferences. Ambassador Sha also made a statement on this issue during Russian President Vladimir Putin's visit to the United States in November 2001.
20. This announcement was made recently by General Zhang Wannian of the PLA.
21. "China Sees Less Chances of War with India," *Times of India* (July 19, 2001), Internet: www.nautilus.org/sand/updates2001/v2n30.html#item11.
22. "Taiwan Role in US Missile Defence," *NAPSNet Daily Report* (July 25, 2001), Internet: www.nautilus.org/napsnet/dr/0107/JUL25.html#item5.
23. Manning et al., *China, Nuclear Weapons, and Arms Control*, Executive Summary.
24. Ibid., 48.
25. Ibid., 49–50.
26. Li Bin, "The effects of NMD on Chinese Strategy," *Jane's International Security News* (July 3, 2001).
27. Ibid.
28. U.S. Department of Defense, *Annual Report on the Military Power of the People's Republic of China* (2000), Internet: http://www.defenselink.mil/news/Jun2000/china06222000.htm.
29. Personal correspondence with Shen Dingli, faculty at Fudan University, Shanghai, China. Also quoted in Arvind Kumar, "China and Export Controls" in Kanti Bajpai and Amitabh Mattoo eds., *The Peacock and The Dragon: India–China Relations in the 21st Century* (New Delhi: Har-Anand Publications, May 2000).
30. George Fernandes declared China to be India's enemy number one prior to India's nuclear tests in the summer of 1998. This was openly stated prior to May 1998 in media conferences.
31. This group includes Indian analysts C. Raja Mohan, Jasjit Singh, and others.
32. This group includes Indian analysts Bharat Karnad and Brahma Chellaney.
33. Roddam Narasimha is a proponent of the concept of hard- and soft-headed liberals. See his views on the evolution of India's nuclear policy, which are published in the proceedings of XIII International Amaldi Conference on Problems of Global Security, Roma Accademia Nazionale Dei Lincei, 2001.
34. This group includes Praful Bidwai, Achin Vanaik, and others.
35. Joseph Cirincione, "The Asian Nuclear Reaction Chain," *Foreign Policy* (Spring 2000), 133.
36. Arvind Kumar, ed., "Report on a Workshop on the Draft Indian Nuclear Doctrine," *NIAS Report R1-2001* (Bangalore: National Institute of Advanced Studies, March 2001), 8; see also, Indian National Security Advisory Board, "Draft Report of National Security Advisory Board on Indian Nuclear Doctrine" (August 17, 1999), Internet: http://www.meadev.nic.in/govt/indnucld.htm.

37. The test flight of India's Agni-II MRBM took place on January 17, 2001. India is also expected to test the Agni-III by the end of 2002, which is reported to have a range of 3,500 kilometers, falling under the category of IRBMs. This capability might give a boost to India's credible minimum nuclear deterrent. The test of Agni-II on January 25, 2002, illustrates that India's missile program is very successful and it will not take long for India to acquire Agni-III.
38. Shekhar Gupta, "Nuclear Weapons in the Subcontinent," *Defense and Insecurity in Southern Asia: The Conventional and Nuclear Dimensions*, Occasional Paper no. 21 (Washington, DC: The Henry L. Stimson Center, May 1995), 45–46. Gupta argues that Pakistan was the first to deploy the Sidewinder air-to-air missiles, which came with F-104s, along with the first anti-tank missiles and air-to-surface precision-guided munitions.

12

The Challenges of Nuclear Minimalism

W. Lawrence Prabhakar

Nuclear weapons are widely viewed within India as "absolute weapons"[1] that would inflict horrendous damage on an antagonist.[2] In view of their mass destruction effects, Indian officials have repeatedly asserted that nuclear weapons are political instruments rather than war-fighting tools. They are, as President K.R. Narayanan has said, useful "only when they are not used."[3] The essential minimal requirements of Indian nuclear deterrence are, therefore, a functioning command and control system and an ability to survive a first strike and provide for an assured retaliatory strike.

The draft Indian nuclear doctrine emerged from varied pressures, including the insistent U.S. stance calling for India to clarify its nuclear intentions. The text of the doctrine is advisory in nature. It was prepared as a confidential recommendation to the Government of India for further deliberation and evolution. However, Indian national security adviser Brajesh Mishra released the document without delay, thus giving the world the impression of its quasi-official status. Implementation of several of the draft doctrine's recommendations would be dependent on indigenous technical developments, prioritization of defense objectives, and resource allocations. The pace and scope of implementation could also be affected by changes in global technology control regimes.[4] Thus, even in the most propitious of circumstances, a significant gap would exist between the draft nuclear doctrine and evolving Indian capabilities.

While the rhetoric of the nuclear doctrine sounds ambitious, subsequent statements and ground realities demonstrate a "defensive orientation for India's nuclear forces and a commitment to avoid a nuclear arms race."[5] The combination of minimum deterrence and a commitment to no-first-use provides a hedge against nuclear adventurism while averting the exorbitant and costly mistakes of a maximalist nuclear posture, which would undercut India's conventional capabilities and its campaign for nuclear disarmament. Furthermore, the draft nuclear doctrine does not calculate India's nuclear force posture by mere arithmetic alone, but by the quality and quantum of its forces and the spectrum of threats it must contend with in the present and future.

The draft nuclear doctrine was intended to reinforce the prevalent Indian stand on nuclear disarmament and the avowed goal to eliminate nuclear weapons. India's strategic approach has always been one of defensive-defense and the draft doctrine emphasizes India's pacific intent.[6] One imperative for the doctrine was to make Indian nuclear motives transparent; another was to initiate an open policy debate. A third consideration was to assert India's nuclear dominance over Pakistan and highlight India's need for a limited and graduated deterrent capability vis-à-vis China. While balancing these imperatives, India seeks a doctrine of nuclear minimalism.

Foundations of Nuclear Minimalism

While there are differences of view within India on virtually every issue, there is a working consensus on the need for a minimal nuclear capability to deter adventurism by potential adversaries. India's most immediate threat comes from Pakistan, a state that sees itself as a competitor, and that engages in daily violence against India in Kashmir. The potential for escalation resides in these violent interactions. Another danger for India is a weak and paranoid Pakistan that might brandish its nuclear weaponry and engage in unanticipated and uncontrolled escalation. Pakistan's doctrine, which maintains an option of first use of nuclear weapons, adds to these concerns. While these concerns mandate India's attention, they do not mandate significant nuclear requirements, since it would not require many weapons to destroy Pakistan as a functioning state. Indian officials are convinced that Pakistan, despite making nuclear threats in crisis situations, would understand the suicidal consequences of crossing the nuclear threshold.

China presents a different set of challenges. China lays claim to 90,000 square kilometers of Indian territory in Arunachal Pradesh and occupies parts of the old princely state of Jammu and Kashmir. The Sino-Indian boundary issue has yet to be officially settled, but the interim agreements of Zones of Peace and Tranquility along the border have provided for a more-or-less stable bilateral relationship since 1988.[7] China's territorial claims vis-à-vis India are entirely different from its claims on Taiwan, over which Beijing could go to war. Although Beijing refuses to abdicate claims on Indian territory, it does not consider these disputes to be worthy of another war. In addition, India has deployed substantial conventional forces to deter Beijing from incursions into Indian-held territory. Moreover, the prospects of future military confrontations between Beijing and New Delhi are diminished by offsetting nuclear capabilities. Both capitals have other, more important, concerns to pursue. China has adopted a no-first-use nuclear doctrine, and Indian officials are not concerned about a nuclear first strike by China against India. Thus, India can pursue a minimalist nuclear posture vis-à-vis China as well as Pakistan. Substantial improvements in Indian conventional forces would reinforce Indian nuclear minimalism. India, in other words, emphasizes the adjective, "nuclear", over the noun, "weaponry."[8] In governing circles within India, it is widely believed that the existence of

India's nuclear capability is the primary deterrent, while issues of size, readiness, and deployment are secondary issues. India's nuclear capability is a national political asset and an insurance policy against nuclear blackmail, coercion, and potential use by an adversary. These national assets are not viewed as war-fighting instruments.

Another contributing factor for India's nuclear minimalism is New Delhi's continued commitment to global nuclear disarmament. The Government of India argued before the International Court of Justice in 1994 that "any use of nuclear weapons to promote national policy objectives would be unlawful."[9] India continues to call for universal and nondiscriminatory nuclear disarmament, rejecting the partiality of the Nonproliferation Treaty (NPT) and the Comprehensive Test Ban Treaty (CTBT), which, in New Delhi's view, perpetuate inequality. The weaponization process has, however, created obvious dilemmas for India's nuclear disarmament diplomacy. New Delhi manages these contradictions by asserting that the acquisition of nuclear weapons has been a reluctant, but necessary, choice to preserve national security and autonomy of action in an increasingly anarchic world.

At the same time, India's rejection of nuclear war-fighting concepts reflects a continued commitment to minimizing the role of nuclear weapons until nuclear disarmament can be achieved. India's embrace of a no-first-use posture can be viewed in a similar context. This posture affirms India's stance on de-legitimizing nuclear weapons as weapons of war. It helps underscore India's pacific intentions toward Pakistan and China, while reinforcing India's preference for a de-alerted and de-mated force posture—a force-in-being rather than a ready arsenal for rapid response.[10] This constitutes a minimum nuclear posture that poses the least incompatibility with New Delhi's declared goal of global, verifiable, nuclear disarmament.

The economics of nuclearization also contribute to minimalism. New Delhi's top defense priority is investment in conventional forces. India must have the capability to defend against Kargil-type contingencies and to incorporate some features of the revolution in military affairs in carrying out future conventional missions.[11] Excessive investment in nuclear weapons would create distortions between conventional and nuclear expenditures. Indian armed forces zealously pursue conventional force modernization programs. They would not be keen to siphon off resources into tri-service nuclear weaponry. The organizational elements of India's nuclear posture, in which civilian control over the Indian military is secure, reinforce nuclear minimalism. India's political leaders are keen to configure nuclear weapons as political instruments of statecraft rather than as war-fighting instruments. A reorientation of India's nuclear capabilities toward war fighting would undermine their political value. Moreover, the integration of nuclear weapons into the Indian armed forces would mean the detailed delegation of command, control, and operations to the armed forces. It could also pave the way for the development of tactical nuclear weapons, the deployment of which would erode civilian control.

India's bureaucratic command and control setup further contributes to nuclear minimalism. The command structure of India's nuclear forces

emanates from the president, the prime minister, and the cabinet, with the home, external affairs, defense, and finance ministers in principal positions on the Cabinet Committee on Security.[12] The Cabinet Committee on Security is assisted by the National Security Advisor, the Cabinet Secretary, the Strategic Policy Group, the three chiefs of staff, the heads of Atomic Energy (DAE), the Defense Research Development Organization (DRDO), and the chiefs of the intelligence agencies. The service chiefs, through a Chiefs of Staff Committee, report to the defense secretary and defense minister and ultimately the prime minister and, hence, are removed from the Defense Ministry. The Defense Ministry is primarily run by the Indian Administrative Service, which has responsibility for budgetary, strategic, acquisition, and personnel decisions. All of the recommendations, opinions, and requests of the service chiefs are channeled through the civilian bureaucracy. This structure poses significant operational problems for the military command structure and for military roles in decision making on strategic matters. India's civilian bureaucracy has maintained a position of dominance rooted in the democratic foundations of the Indian political system.

The position of Chief of Defense Staff (CDS) was created in May 2001 so that nuclear matters would be handled through the single focal point to the government.[13] It is unrealistic to expect, however, that the CDS would acquire significant authority over India's nuclear forces. Instead, the role of the CDS is likely to be confined to the innovation of the tri-service doctrine to conduct operations in the nuclear environment, and to the planning, organization, training, and equipment of the armed forces.[14] The control of the nuclear warheads and their ultimate release would remain with civilian authorities, thus reinforcing political control of India's nuclear weapons.

Minimalism vs. Ground Realities

India's nuclear minimalism and its emphasis on viewing nuclear weapons as political, rather than military, instruments is challenged by ground realities, especially in Pakistan. Pakistan's military leaders regard nuclear weapons as essential to national defense as well as deterrence. In this view, nuclear weapons equalize Pakistan's conventional military disparities with India. Nuclear weapons also provide a backdrop for Pakistan's support for militancy in Kashmir. In effect, Pakistan has pursued a conventionalization of its nuclear strategy, with dangerous portents for regional and strategic stability. The possibility of a breakdown in deterrence cannot be dismissed. Unconventional warfare could escalate to conventional conflict, which in turn, approaches the nuclear threshold. New Delhi's response to the asymmetries in Pakistan's conventional military capability and nuclear posture has been to focus on maintaining survivable delivery systems for the nuclear option, and not to pursue a war-fighting posture.

This response is noninflammatory, but it leaves many open questions, such as what New Delhi would actually do in the event of a breakdown in nuclear deterrence. Planning is required for optimal responses to a variety of

contingencies, including worst-case scenarios. India has been reluctant to address these issues, instead taking comfort in rhetorical statements. Having acquired the nuclear option, the Government of India has to confront the harsh realities of configuring command and control arrangements, rules for the delegation of authority, civil-military coordination, strategies of survivability, and calibrated responses.

India's draft nuclear doctrine sheds little light on these subjects.[15] This document states requirements without a strategy of employment, as if the advent of nuclear weapons makes an employment strategy unnecessary. This is reflective of Indian strategic culture, which ascribes absolute characteristics to nuclear weapons and affirms existential deterrence. But targeting, escalation control, and other military considerations must accompany the development and acquisition of a nuclear deterrent. These concerns do not disappear by adhering to a no-first-use policy.

Targeting is constrained by the size of India's arsenal, the yield of its weapons, the nature of satellite-based intelligence of targets, and the accuracy of the means of delivery. Counterforce targeting (striking nuclear forces, launch control centers, weapon storage sites, field formations, troops concentrations, air and naval bases, logistics, and repair and supply facilities) would require accurate and timely means of delivery. While manned aircraft are likely to provide greater accuracy than missiles, the penetration of air defenses could be a challenge in some scenarios. Furthermore, counterforce targeting of Chinese assets would be especially challenging owing to rugged terrain, long distances, and the dispersal of Chinese strategic assets in caves, hardened silos, or in highly mobile configurations. Countervalue targeting of industrial, economic, and population centers requires less accuracy, nuclear weapons, and timeliness. In all probability, India would pursue a countervalue targeting strategy.

India's no-first-use commitment is central to its concept of nuclear minimalism. The no-first-use pledge was officially proposed for the first time to Pakistan in 1994 as a formal arms control measure and has been reiterated by Indian political leaders many times since. In the aftermath of the May 1998 nuclear tests, a formal no-first-use declaration was included in the "Paper Laid on the Table of the House on Evolution of India's Nuclear Policy" on May 27, 1998.[16] India's no-first-use policy states that India would not resort to the use or threat of use of nuclear weapons against states that do not posses nuclear weapons or are not aligned with nuclear weapon powers. This posture provides diplomatic utility, while raising potential operational dilemmas. Presumably, nuclear weapons states include the five permanent members of the United Nations Security Council, Pakistan, Israel, and perhaps North Korea. By including the allies of nuclear powers, India's draft nuclear doctrine excludes from the no-first-use pledge the nonnuclear NATO allies of the United States; the United Kingdom's Five Power Defense Agreement, which includes Malaysia, Singapore, Australia, and New Zealand; and the eleven nonnuclear partners of Russia in the Commonwealth of Independent States.[17]

Several operational aspects of the no-first-use pledge are worthy of analysis. First, despite the remoteness of a military confrontation between India and China, it is not possible to completely rule out a future clash. In this unlikely scenario, India would rely on its conventional forces to sustain strong forward defense positions. Second, India's no-first-use pledge does not, by itself, prevent conventional military strikes against nuclear facilities. Pakistan might well not differentiate between the means used to attack its nuclear deterrent, in which case India's no-first-use pledge would lose its meaning. Third, the applicability of India's no-first-use pledge in a scenario involving an attack by chemical or biological weapons is unclear. A narrowly defined no-first-use pledge could leave India open to threats from other weapons of mass destruction (WMD), although deliberate ambiguity on this issue may also serve as a deterrent against such attacks.[18]

The ground realities of command and control present additional difficulties for India's nuclear minimalism. India's deployment of nuclear weapons shall arise in circumstances of nuclear coercion or the use of nuclear weapons by an adversary, or perhaps the use of chemical and biological weapons against India. The need to institute a viable command and control structure is essential regardless of the scenario. But scenarios involving Pakistan require considerable prior consideration given Pakistan's strategic and military culture, which places a premium on taking the offensive. If Pakistan is first to cross the nuclear threshold, and does so in such a way as to signal a desire to cease hostilities and control escalation, India might respond in an assured, sufficient, and credible manner. Punishment could be meted out in minimal ways, requiring modest capabilities.[19] A large-scale Pakistani nuclear attack or misperceptions by India concerning Pakistan's intentions might tempt India to respond to any Pakistani first strike with a massive retaliation.

A minimal nuclear exchange and successful escalation control requires that both parties adhere to the same rules. There can be no assurance of these conditions. Consequently, India might have to consider being prepared for a much larger first strike from Pakistan. In this context, India's nuclear posture might need to be configured to buttress its conventional superiority and to establish the prospect of escalation dominance so that India could terminate a conflict on its own conditions.[20] These objectives, however, require planning and nuclear capabilities that run counter to India's concept of nuclear minimalism. For example, India could prepare for uncontrolled escalation by seeking the capability to destroy as much of Pakistan's nuclear deterrent as possible, or to pursue what is known in the West as a "damage limitation" targeting strategy. But by seeking such capabilities, New Delhi might increase the probability that any first strike by Pakistan would be unlimited.

In scenarios of nuclear weapons' use between India and Pakistan, the choice of proportionate and graduated retaliation or massive retaliation is critical. Minimal deterrence suggests retaliation in a similar quantum. To do less, or to succumb to a first strike is unacceptable. A more ambitious nuclear strategy would seek to seize the initiative and to terminate aggression on

India's terms. In the latter case, India must possess the nuclear means and the command and control to execute a massive retaliatory strike which, in turn, requires the capacity to transform India's dispersed, de-alerted force into a coherent strike force on short notice.

India must also consider the prospect of—and plan to respond to—the possibility of a joint Pakistani and Chinese attack. This worst-case scenario is not considered likely, but nonetheless demands serious review.[21] Another worst-case scenario, involving large-scale nuclear attacks between India and China, also seems remote given the ability of both countries to disperse and hide their strategic assets. If the fateful choice of confronting a Chinese attack emerges, the Indian response is likely to be graduated and proportionate.[22] India's pursuit of a triad of nuclear delivery means is postulated against worst-case scenarios, keeping in mind the need for secure and assured retaliatory forces.[23] This pursuit will be prolonged, due to India's slow progress in developing and deploying sea-based deterrence. As the triad evolves, India will rely upon a dyad of manned aircraft and land-based, mobile missiles.

The credibility of the Indian nuclear deterrent hinges on the certain means of retaliation more than the speed with which retaliation would be made. Certain retaliation is assured by the survivability and dispersal of India's nuclear assets, and by the sureness with which the retaliation is effected. The extent of retaliation would depend upon the damage to India's nuclear assets and infrastructure.[24] India's draft nuclear doctrine emphasizes the importance of prompt retaliation. However, assured retaliation is more essential than speed. Delay need not be construed as weakness or indecision, as long as retaliation follows. Matters of timing, and the extent of retaliation would be in the hands of the civilian political leadership. The extent of delay before retaliation would be determined by how India manages its nuclear "day after," as well as by the time required to plan and organize the riposte. Would the retaliation be symbolic and limited, or a massive response that would destroy the aggressor's society beyond repair? India might well follow the Chinese approach of certitude of retaliation with uncertain timing.

The need for prompt retaliation is part of a maximalist nuclear agenda. If a nuclear strike occurs after a prolonged crisis, then the Indian "force-in-being" would presumably be converted, at least in part, from a de-alerted and de-mated peacetime capability to one that is ready for use. A surprise war scenario, which is not considered likely in the Subcontinent, would require a matter of days or weeks to ready India's nuclear arsenal. Attempts by the international community to prevent India from retaliating would surely be ignored by India's leaders.

Whatever nuclear capabilities India pursues, its command and control arrangements need to be reinforced to ensure the credibility of the Indian deterrent. And whatever the scenario, India requires a reliable system for the early warning of nuclear attacks. There must be a high degree of mobility for India's nuclear assets—delivery systems, warheads, dummies, and decoys—and proper linkage to the National Command Authority, the apex command and control structure that would direct retaliatory strike operations. In the

light of the perceived vulnerability of the National Command Authority to a decapitating first strike, India must create alternate, survivable national command posts that connect national leaders, civilian members of the atomic establishment, and leaders of the armed forces.

The Impact of Missile Defenses on India's Nuclear Posture

Prospective U.S. missile defense deployments and the abrogation of the Anti-Ballistic Missile Treaty could have quite varied impacts on India's nuclear posture. Increased U.S. deployments of theater missile defenses around Taiwan would likely result in increases in China's short- and medium-range ballistic missiles. These missiles are becoming increasingly accurate and are capable of hitting strategic counter-force targets on the island.[25] If the range and deployment areas of these missiles do not suggest a threat to India, they are unlikely to lead to a direct increase in Indian nuclear requirements. However, the proliferation or transfer by China of such missile technology to Pakistan could increase India's requirements.

If the United States deploys combined national and theater missile defenses, China is likely to respond by increasing the number of its intercontinental ballistic missiles, sea-launched missiles, and long-range, land-attack cruise missiles.[26] The United States intelligence community estimates that by 2015, China will be able to quadruple the number of its nuclear-armed ICBMs.[27]

Increases in China's medium-, intermediate-, and intercontinental-range missiles and countermeasures are less technologically challenging and more cost-effective—and therefore more likely—than opting for a comprehensive missile defense. Mobile intermediate-range missiles would provide China with the capability for rapid re-deployment of missiles that could target India. Intercontinental-range missiles could also be used against India, as could forward-deployed medium-range missiles. The Indian response to such deployments would be to counter the Chinese missile buildup.

If a Chinese missile buildup were accompanied by continued support for Pakistan's missile and/or nuclear programs, this would heighten India's concerns. Pakistan might even become a beneficiary of China's strategic modernization programs, if Beijing conveys to Islamabad older missile systems that are replaced by newer, solid-fueled types.[28] There is also a possibility that U.S. missile defense plans against the North Korean threat could bolster North Korean–Pakistani missile cooperation.[29] In response to heightened missile and nuclear threat perceptions, India would likely accelerate the testing and deployment of Agni-II and II-B intermediate-range missiles that could place targets such as Chengdu and Liupanshui within reach, as well as the Agni-III, which could target Beijing and Shanghai.

In other words, there are a number of scenarios associated with missile defense deployments that feature an increased buildup of nuclear weapons and missiles in Pakistan, India, and China. Depending on the extent of

China's buildup, India could be pressed to resume nuclear testing to perfect new warhead designs for missiles with improved range. Increased threat perceptions from China could also encourage India's drive to acquire a sea-based nuclear deterrent capability in the form of submarine-launched cruise missiles.[30] India might eventually be provoked to move from a recessed deterrent posture to a deployed nuclear posture. India's defense spending in the sectors of nuclear and missile development would steeply rise to maintain superiority over Pakistan and to achieve a robust conventional and limited nuclear deterrent capability vis-à-vis China. India would have to be somewhat in step with China with regard to China's new missile buildup, though it would not be wise to match China system for system.

With the deployment of U.S. missile defenses, China would seek to develop effective countermeasures and deploy new variants of missiles with decoys that frustrate any missile defense.[31] If India decides to deploy missile defenses, Pakistan could pursue similar countermeasures, perhaps in collusion with China. The nature and extent of China's countermeasures to U.S. missile defense deployments would certainly have a bearing on India's calculations of the requirements of deterrence vis-à-vis China.[32] Since neither China nor Pakistan is likely to pursue nationwide missile defenses, India would not need to develop decoys or countermeasures. While technological drivers may encourage India to enhance its missile force with MIRVs, matching China's MIRV buildups would be unnecessary, self-defeating, and contrary to India's commitment to nuclear minimalism.

China, India, and Pakistan are unlikely to adopt national missile defenses given their expense and their limited effectiveness in providing national protection. The cost of even regional missile defense systems for China or India would be enormous. In India, such expenditures would cut into its nuclear and missile programs and overstretch its defense budget, already burdened by the need to prepare for conventional, Kargil-type activities. In the long run, however, India may eventually opt for a limited missile defense with the Russian SA-300 and a mix of indigenous systems like the Akash and the Trishul for medium-level interception, and may seek to collaborate with the United States for the transfer of PAC-3 systems or equivalent technology for indigenous production. For now, all three countries are likely to conclude that increasing missile capabilities makes more sense than spending resources to acquire and deploy national missile defenses.

While the prospect of India deploying an extensive, integrated air and missile defense capability would be very remote in view of its vast territory, India might consider deploying combined air and missile defenses for selected areas. Given Pakistan's first-use posture and its philosophy of taking the military offensive, India could opt for an integrated air and missile defense for New Delhi, which hosts the National Command Authority. Perhaps such defenses could also be employed over other areas of strategic and industrial importance, such as nuclear facilities.

India is likely to encounter problems with the indigenous development of ballistic missile defense systems and would have to rely either on Russian

systems or possibly, limited technology transfers from the United States. The Akash and Trishul missiles have capabilities against supersonic, manned, fighter aircraft, but the extent of their intercept capabilities against ballistic missiles is likely to be very limited.[33] Another option for India would be to opt for technological collaboration and indigenous co-production agreements for a combined air and missile defense system with Russia. Russia could offer limited missile defenses against short- to medium-range ballistic missiles in the form of the SA-300 system. Russia appears willing to sell the SA-300 to both China as well as India.[34] If purchasing the SA-300 becomes a priority, Beijing and New Delhi would likely prefer initially to import the integrated air defense network and then have Russian specialists help with indigenous programs for further development. Alternatively, India might seek U.S. missile defense technology, which could open new avenues for bilateral cooperation and technology transfers with Washington.

India could argue that an effective, omni-directional air and missile defense capability is consistent with its non-provocative nuclear posture. However, such defenses would be extremely expensive, as well as unlikely to negate China's strategic modernization programs. India would prefer at least a limited missile defense for New Delhi and Bombay to protect against a surprise attack from Pakistan. However, limited defenses vis-à-vis Pakistan might also be overwhelmed by missile barrages or countermeasures, particularly if China–Pakistan missile proliferation and technology transfers continue unabated.[35] India might overcome these technical problems with the assistance of the United States if India attaches a high priority to this task and if countering Chinese hegemony in the region becomes a U.S. priority.

On balance, the deployment of combined air and missile defenses by India would be an expensive and difficult decision for New Delhi. India has many urgent conventional military needs. In addition, India must maintain and adapt its strategic force-in-being. Given its limited resources, India is not likely to fund missile defenses at the expense of its missile programs such as the Prithvi, Agni-I, Agni-II, and Agni-III, which constitute the cornerstone of its deterrence posture. It would be very difficult to justify and sustain expenditures on missile defense research, development, and deployment while simultaneously sustaining expenditures for ongoing missile modernization programs. The consideration of a national missile defense umbrella for India is premature in terms of technology development and exorbitant in terms of resource outlays. Even the consideration of limited missile defense deployments would be difficult. Nonetheless, India will be impelled to consider an integrated air-missile defense capability in the event of quantum increases in the threat from China and Pakistan.

The luxury of avoiding the choice between nuclear and missile programs on the one hand, and missile defenses on the other, depends on the pace of India's economic growth and its defense expenditures. Continued difficulties arising from Pakistan's support for militancy in Kashmir, the priority given to increased outlays for conventional forces, and the maintenance of India's missile programs leave few resources for missile defenses.

Conclusion

India's nuclear posture will reflect many factors: self reliance and indigenous technological developments; nuclear and missile developments in China and Pakistan; the state of bilateral relations with both countries, as well as ties with the United States and Russia; domestic economic factors; technology denial efforts by industrialized states; US missile defense plans; and India's strategic culture, which favors nuclear restraint, a minimal definition of the requirements of nuclear deterrence, and a force-in-being alongside continued support for global nuclear disarmament.

India relies on a robust conventional military posture and reserves nuclear weapons for retaliation and as a last resort. New Delhi takes comfort in a declaratory posture that emphasizes a pledge of no-first-use. This posture, however, raises but does not answer a number of difficult operational questions. Moreover, India's commitment to nuclear minimalism could be challenged by developments in China and Pakistan, as well as by prospective U.S. missile defense deployments. If China responds vigorously to missile defenses, India would have to rethink its force-in-being nuclear posture.

While India has embraced the concept of minimal, credible nuclear deterrence, the size and scope of the Indian nuclear deterrent are not limited by any quantitative matrix. Given the asymmetric situation vis-à-vis Pakistan and China, India's targeting requirements cannot be completely divorced from developments elsewhere in the region. This issue is also linked to fissile material stocks in India. The scope of India's minimum deterrent is therefore subject to debate and change. India would find it very difficult to accept limits imposed by other nuclear powers. Pressures to test and deploy new nuclear weapons with better yields, and the deployment of improved delivery vehicles would certainly arise. Thus, it would be difficult to prescribe a definition for the term "minimum," as it would vary according to the asymmetric nuclear situations India contends within its fluid geostrategic environment. The issuance of a draft nuclear doctrine is an important first step in India's evolving nuclear posture and operational planning.

Notes

1. This term is borrowed from Bernard Brodie ed, *The Absolute Weapon: Atomic Power and World Order* (New York: Harcourt & Brace, 1946). For an Indian perspective on this subject, see Raja Ramanna, "Security, Deterrence and the Future," *Journal of the United Services Institution of India* vol. 122, no. 509 (July–September 1992): 283.
2. The author wishes to acknowledge Michael Krepon for his encouragement. Inputs were also provided by Stephen Cohen, Elizabeth Hanson, John Parachini, Leonard Spector, Lawrence Scheinman, Ashley Tellis, Peter Lavoy, P.R. Chari, Arvind Kumar, and Chris Gagné. An earlier version of this essay was originally published in Michael Krepon and Chris Gagné, *The Impact of US Missile Defenses on Southern Asia*, report no. 46 (Washington, DC: The Henry L. Stimson Center, July 2002), 45–60.

3. Address to the nation at the closing function of the Golden Jubilee celebrations of India's independence in New Delhi on August 15, 1998, reprinted in *India News* (July 16–August 15, 1998), 3.
4. The implications of technological sanctions and the concerns of nuclear proliferation are well detailed in Jeanne J. Grimmet, "Nuclear Sanctions: Sec 102 (b) of the Arms Export Control Act and its Application to India and Pakistan" *CRS Report for the Congress* (Washington DC: Library of Congress, updated October 30, 1998). In the post-Pokhran II period, the U.S. stand with regard to India on technology transfers given India's non-complicity to the NPT, has been reinforced. See "U.S. High Tech To Remain 'Out of Bounds for India,'" *Hindustan Times* (India) (January 15, 1999). However, in the post–September 11 period, US–Indian defense ties have experienced an upswing, making agreements on defense technology transfers in the conventional realm now more feasible. See "India seals major arms deal with US" the *Hindu* (India) (April 18, 2002).
5. Brajesh Mishra quoted in "India Committed to Minimum N-Deterrence," the *Hindu* (India) (December 7, 1998).
6. Indian National Security Advisory Board, *Draft Report of National Security Advisory Board on Indian Nuclear Doctrine* (August 17, 1999), Internet: http://www.indianembassy.org/policy/CTBT/nuclear_doctrine_aug_17_1999.html.
7. See K. Subrahmanyam, "Nuclear India in Global Politics," *World Affairs* vol. 2, no. 3 (July–September 1998): 22–23 and Sumit Ganguly, "The Sino-Indian Border Talks 1981–1989: A View from New Delhi" *Asian Survey* vol. 29, no.12 (December 1989): 1123–35.
8. Jasjit Singh, "Why Nuclear Weapons," in Jasjit Singh ed, *Nuclear India* (New Delhi: Knowledge World, 1998), 9–25.
9. The Indian position has been stated in "International Court of Justice Annexure II: Status of Nuclear Weapons in International Law: Request for Advisory Opinion of the International Court of Justice," *Indian Journal of International Law* vol. 37, no. 2 (April–June 1997): 224.
10. Jasjit Singh, "Why Nuclear Weapons."
11. The impetus for conventional force modernization has increased in recent years. See Thomas Mahnken and Timothy Hoyt, "Indian Views of the Emerging Revolution in Military Affairs," *National Security Studies Quarterly* (Summer 2000), 55–80.
12. The Cabinet Committee on Security has emerged as the nodal institution of strategic decision making. See Kotera Bhimaya, "Nuclear Deterrence in South Asia," *Asian Survey* vol. 34, no. 7 (July 1994).
13. Government of India, *Group of Ministers Report on Reforming the National Security System* (New Delhi: Press Information Bureau Releases, May 23, 2001); see also Atul Aneja, "Towards a New Security Architecture," the *Hindu* (India) (February 28, 2001); and Atul Aneja, "GoM Revamp of Defense Management," the *Hindu* (India) (February 27, 2001).
14. Ibid.
15. See G. Balachandran, "India's Nuclear Doctrine" (New Delhi: Institute of Peace and Conflict Studies (August 27, 1999), Internet: http://www.ipcs.org/issues/articles/254-ndi-bala.htm.
16. Government of India, "Paper Laid on the Table of the House on Evolution of India's Nuclear Policy" (May 27, 1998), 4–5. See also "India Evolves Nuclear Doctrine," *Times of India* (August 5, 1998), and "PM Declares No-First Strike" *Indian Express* (August 5, 1998).

17. Ashley Tellis, *India's Emerging Nuclear Posture: Between Recessed Deterrent and Ready Arsenal* (RAND: Santa Monica, 2000), 304.
18. See P.R. Chari, "India's Nuclear Doctrine: Confused Ambitions," *The Nonproliferation Review* vol. 7, no. 3 (Fall–Winter 2000): 134. For more on India's chemical and biological weapons policies, see Anthony H. Cordesman, "Weapons of Mass Destruction in India and Pakistan, Military Balance Updates" (Washington, DC: Center for Strategic and International Studies, February 2002), 4–5.
19. See K.Sundarji, "Changing Military Equations in Asia: The Role of Nuclear Weapons," in Francine Frankel, *Bridging the Nonproliferation Divide: The United States and India* (Philadelphia, PA: University of Pennsylvania, 1995), 119–149.
20. For a brief discussion on India's escalation dominance vis-à-vis Pakistan, see Tellis, *India's Emerging Nuclear Doctrine*, 696–97.
21. See P.R.Chari, "India's Nuclear Doctrine: Confused Ambitions," *The Nonproliferation Review* vol. 7, no. 3 (Fall/Winter 2000): 123–35.
22. See Gregory Jones, "From Testing to Deploying Nuclear Forces: The Hard Choices Facing India and Pakistan," IP-192 (Santa Monica, CA: RAND, 2000).
23. Waheguri Pal Singh Sidhu, "India Sees Safety in a Nuclear Triad and Second Strike Potential," *Jane's Intelligence Review* vol. 10, no. 7 (July 1998): 25.
24. See Gurmeet Kanwal: "Nuclear Targeting Philosophy of India," *Strategic Analyses* vol. 24, no. 3 (June 2000): 459–73.
25. See Michael J. Green and Toby F. Dalton, "Asian reactions to US Missile Defense," *NBR Publications: NBR Analysis* vol. 11, no. 3 (November 2000), Internet: http://www.nbr.org/publications/analysis/vol11no3/index.html.
26. Office of the U.S. Secretary of Defense, *Proliferation: Threat and Response* (Washington, DC: US Department of Defense, January 2000), 14, Internet: http://www.defenselink.mil/pubs/ptr20010110.pdf.
27. U.S. National Intelligence Council, *Foreign Missile Developments and the Ballistic Missile Threat Through 2015* (December 2001), 3, Internet: http://www.odci.gov/nic/pubs/index.htm.
28. Bates Gill and James Mulvenon, "The Chinese Strategic Rocket Forces," *Bulletin of Atomic Scientists* (May–June 1999).
29. "Executive Summary," *Report of the Commission to Assess the Ballistic Missile Threat to the United States* (July 15, 1998), Internet: http://www.fas.org/irp/threat/missile/rumsfeld/index.html; Pakistan Institute of Air Defence Studies, "Pakistan's Missile System" (1999), Internet: http://www.piads.com.pk/users/piads/pmsintro.html, and Brahma Chellaney, "New Delhi's Dilemma," *The Washington Quarterly* (Summer 2000), 149.
30. See Waheguru Pal Singh Sidhu, "Asian Nuclear Testing: India Sees Safety in Nuclear Triad and Second Strike Potential," *Jane's Intelligence Review,* Issue PSA-2135 (July 1, 1998); and also Vladimir Radyuhin, "INS Sindhushastra Commissioned," the *Hindu* (India) (July 20, 2000).
31. "China To Counter U.S. Missile Defense, But Not With Arms Race," *Agence France Presse* (July 13, 2000). See also Michael J. Green and Toby F. Dalton, "Asian Reactions to U.S. Missile Defense," *NBR Publications: NBR Analysis* vol. 11, no. 3 (November 2000), and John Pomfret, "China Threatens Arms Control Collapse," *Washington Post* (July 14, 2000).
32. China and India are seeking the procurement and eventual transfer of SA-300 anti-missile technology with their adaptations. See "India Ponders New Russian

Air Defense System; Plan May Rile Beijing," *Stratfor.com* (June 21, 2001), and "Moscow abandons China for India," *Stratfor.com* (June 30, 2000).

33. Group Captain R.G. Burli, "India's Option for Space-based BMD," *Indian Air Force 2000* (New Delhi: Indian Air Force, 2000), 40–42.
34. See Waheguru Pal Singh Sidhu, "The Implications for Postures and Capabilities in South Asia," *Missile Proliferation and Defences: Problems and Prospects* Occasional Paper no. 7 (Monterey, CA: Center for Nonproliferation Studies, Monterey Institute of International Studies, 2001).
35. Brahma Chellaney, "New Delhi's Dilemma," *The Washington Quarterly* vol. 23, no. 3 (Summer 2000): 151.

13

Missile Defense and the Asian Cascade

Michael Krepon

With the end of the Cold War, Asia has replaced Europe as the region most likely to be roiled by prospective U.S. missile defense deployments.[1] While European capitals remain uncomfortable with American impulses to construct a national missile shield, these concerns pale in comparison to the 1980s, when Moscow employed intense coercive diplomacy and military bluster trying to block President Ronald Reagan's Strategic Defense Initiative. Back then, hundreds of thousands of street demonstrators rallied across Europe against the "Star Wars" program. In contrast, President George W. Bush's decisions to abrogate the Anti-Ballistic Missile Treaty and fast-track national missile defenses produced a muted response in Europe. This time around, Moscow's diplomatic and military options were quite limited, with the Kremlin's defense budget in 2002 barely one-twelfth that of the United States. If European misgivings rise again, the most likely cause will be overreaching by Washington rather than posturing by Moscow.

Washington's missile defense decisions matter far more around the periphery of Asia and along its most consequential fault lines. Abstract debates in European capitals over the utility or disutility of missile defenses have concrete meaning for Beijing, Taipei, Tokyo, New Delhi, Islamabad, Seoul, and Pyongyang. Taipei views missile defense deployments as an opportunity to reconnect with the U.S. military establishment and as a symbolic counter to China's missile buildup. Beijing is the most vocal opponent of ballistic missile defenses and, unlike Moscow, has the capacity to increase its nuclear capabilities in reaction to U.S. programs. New Delhi does not oppose U.S. missile defense plans, hoping to solidify military and diplomatic ties to Washington. Privately, however, Indian officials worry about the wisdom of Washington's moves and Beijing's likely reactions to them, including renewed missile or nuclear assistance to Pakistan. Islamabad is plainly concerned about military technology transfers between India and the United States, and has lined up with China in opposition to ballistic missile defenses. Tokyo has mixed emotions, worrying both about U.S. belligerency and Beijing's growing arsenal of theater ballistic missiles. Japanese

concerns shift seamlessly between not being enmeshed in unwise U.S. policies and not being properly defended by Washington. A thaw between Seoul and Pyongyang depends in good measure on the outcome of U.S. diplomacy and missile defense deployments.

India, Pakistan, and China all have near-term, growing nuclear potential, in contrast to the Russian Federation, whose nuclear capabilities will be trending downwards over the next 10–15 years. In addition, Beijing, New Delhi, and Islamabad all have new and malleable strategic doctrines. Their missile and nuclear interactions could result in shifts from minimal to open-ended requirements for nuclear deterrence. Consequently, U.S. missile defense deployments and transfers could prompt cascading military requirements in China and around the periphery of Asia. Cascade effects could include accelerated growth in nuclear stockpiles, missile inventories, and conventional military capabilities.

In some ways, missile defenses are like nuclear weapons. Their military utility is questionable in times of war. Even so, missile defenses, like nuclear weapons, have very high political salience. And like nuclear weapons, missile defenses could have either political utility or disutility, depending on how others react to them. The political salience and presumed utility of nuclear weapons remain high even though they have not been used on the battlefield in over five decades. This prolonged period of nonuse reflects questionable military utility or the efficacy of nuclear deterrence. Either way, political dimensions dominate. Even in the absence of battlefield use, every nuclear weapon test, every flight-test of a missile designed to carry nuclear weapons, and every nuclear modernization program sends powerful messages to neighbors and potential adversaries. States on the receiving end of these messages can react supinely, seek the shelter of powerful allies, or respond in kind.

These dynamics also apply to missile defenses, albeit with important variations. Theater missile defenses are likely to see repeated use on the battlefield, but they could be overwhelmed by large inventories of short-range ballistic missiles, such as those possessed by China and North Korea. Similarly, national missile defenses cannot be relied upon to stop large numbers of missiles equipped with countermeasures. Nonetheless, the political salience of missile defenses is extremely high in Asia. Washington's decisions regarding missile defenses could improve some bilateral ties, while causing significant deterioration in others. Missile defense deployments or transfers in Asia could cause serious spikes in regional tensions or help defuse crises. No U.S. defense modernization programs have more up-side potential and downside risk than missile defenses.

Asian Triangulation

With the demise of the Soviet Union, nuclear signaling has shifted to Asia, becoming most pronounced in triangular interactions among China, India, and Pakistan. While other nations were signing and ratifying the

Comprehensive Test Ban Treaty (CTBT), India and Pakistan tested nuclear weapons. Prior to the Treaty's completion, China carried out a hurried and perhaps incomplete series of tests. All three states have active production lines for short-, medium-, and intermediate-range ballistic missiles. The testing of nuclear weapons and ballistic missiles demonstrates national resolve for these countries, whose modern history includes periods of humbling subservience. Testing demonstrates that Beijing, New Delhi, and Islamabad will not accept dictation. Nor will they seek refuge in formal alliances. Leaders in all three countries view nuclear weapons and missiles as instruments of independence, power, status, and protection against stronger competitors.

Consequently, China, India, and Pakistan are enmeshed in a three-cornered interaction that will not be easy to stabilize. It was hard enough during the Cold War to maintain strategic stability in a two-power equation when: both Washington and Moscow acknowledged that stability required acceptance of rough numerical parity; meaningful changes in the nuclear balance were readily observable; both superpowers acknowledged the need for intrusive monitoring; and when the implementation of treaty obligations was verifiable. Southern Asia presents a far more complex model. Leaders in Beijing, New Delhi, and Islamabad all say that minimum deterrence will serve as their guide, and that they will avoid the competitive drives leading to ever-larger nuclear arsenals. But national leaders in all three countries have also acknowledged that deterrence is not a static concept. The requirements of each state will depend, in some measure, on what the others are doing or might seek to do.

Accepting—let alone codifying—an hierarchical, triangular relationship will be extraordinarily difficult for these proud nations. No two sides of the triangle in southern Asia are equal, and within the triangle, there are two competing dyads. In geometrical terms, there is nothing inherently stable about a triangle consisting of three unequal sides. India clashes with Pakistan over a disputed border and jockeys with China over contested areas. India and Pakistan are enmeshed in a deadly dispute over Kashmir. India and China are acutely sensitive over Tibet and anticipate a competition between "blue water" navies. All three countries worry about Islamic extremism. Nuclear weapons and missile programs now overlay these neuralgic issues, making it even harder for national leaders in China, India, and Pakistan to create and sustain a stable strategic environment.

The close triangular interactions involving China, India, and Pakistan magnify nuclear message sending, within and beyond the confines of southern Asia. Prospective U.S. missile defense deployments will undoubtedly compound these tympanum effects. To complicate matters further, the regional effects of U.S. missile defense deployments are invariably crosscutting. Harmony in one sphere produces dissonance in the next. Take, for example, the case of Japan. Deployments that soothe Japanese concerns could easily rub Chinese sensibilities raw. Conversely, voluntary restraint by Washington in the face of Chinese or North Korean missile threats could be

as unsettling to Japan as ill-conceived transfers. Whatever deployment choice is agreed upon by Washington and Tokyo will likely raise sensitive constitutional, civil–military, and burden sharing questions in Japan.

The United States and the Soviet Union engaged in an extended strategic dialogue to establish the rules of their nuclear competition. Severe crises were followed by bilateral arrangements to improve communication lines and mutual understanding. Triangular interactions in southern Asia follow different patterns. Crises and wars are usually followed either by deep freezes or poorly implemented confidence-building measures. Over the last decade, Beijing and New Delhi have begun a strategic dialogue, but their interactions on nuclear matters have dwelled on China's displeasure at being obliquely named as a reason for India's nuclear tests in 1998, and New Delhi's concerns over China's support for Pakistan's nuclear and missile capabilities. China has been reluctant to discuss mechanisms to stabilize the Sino-Indian nuclear relationship in a context that presumes equality.

Relations between India and Pakistan have oscillated wildly, marked by nuclear testing in 1998, and the Lahore summit in 1999 that suggested the possibility of a paradigm shift in bilateral relations, only to be followed by a Pakistan Army-led and planned military probe to seize high ground on the Indian side of divided Kashmir. The ensuing high-altitude combat over the summer of 1999 generated increased readiness in nuclear capabilities, but did not have the chastening effects produced by other nuclear scares, such as the Cuban missile crisis. The Kremlin lied blatantly before and during the Cuban missile crisis. Nonetheless, this hair-raising brush with nuclear disaster led the Kennedy administration to pursue nuclear risk-reduction arrangements with the Kremlin, which took immediate form in the Hotline agreement establishing direct and reliable communications between national leaders. In contrast, New Delhi reacted to Pakistan's dissimulations about the high-altitude war by seeking to isolate its nuclear neighbor. The Indian government's policy of containment reflected domestic political imperatives as well as official calculations that isolating Pakistan would yield greater benefit than formalizing nuclear risk-reduction arrangements with an unreliable negotiating partner.

India's containment policy toward Pakistan lasted for two years, after which Prime Minister Atal Bihari Vajpayee invited the "architect" of the 1999 war, General Pervez Musharraf, to Agra for an unscripted summit. The July 2001 Agra summit failed to achieve an agreed structure for subsequent dialogue, breaking down in public wrangling over the Kashmir dispute. Then came the September 2001 demolition of the twin towers of the World Trade Center. The ensuing U.S. war against the al-Qaeda terrorist network added new layers of complication to nuclear risk-reduction efforts on the Subcontinent. By suddenly becoming a frontline state in the war against terrorism, Pakistan's military government now distanced itself from groups that used to do its bidding in Kashmir. Backlash predictably followed. When a band of terrorists attacked the Indian Parliament building in December 2001, South Asia witnessed another mobilization of two huge standing armies, as nuclear capabilities were again readied for use.

Supporters of nuclear weapons in India and Pakistan casually predicted that the 1998 tests would usher in a period of stability on the Subcontinent. Instead, India and Pakistan, like other adversarial nuclear dyads, immediately became more deeply enmeshed in crises and border clashes. South Asia's rollercoaster ride provided little time or space to put in place nuclear risk-reduction measures like those employed by Washington and Moscow to stabilize their Cold War pursuits. Instead, nuclear dangers remained intertwined with the Kashmir dispute. Crises became more frequent, and more dangerous.

Deterrence theorists in the West have a name for this phenomenon: the "stability-instability paradox."[2] The essence of this paradox is that, while offsetting nuclear capabilities might foreclose a central strategic exchange, they might also increase provocations and risk taking at lower levels—whether to remedy perceived weaknesses or to press territorial claims. Nuclear weapons can generate risk taking because they presumably provide an insurance policy against escalation. The most dangerous time to control escalation usually comes in the years immediately after both adversaries initially possess nuclear capabilities. During this awkward period, tolerance levels or "red lines" have not been clarified, the nuclear balance is unclear, and risk-reduction arrangements have not been implemented. At the earliest stages of offsetting nuclear capabilities, new weapon developments add to threat perceptions and uncertainties. India and Pakistan are now proceeding through this difficult passage.

The prospective deployment of ballistic missile defenses by the United States will surely complicate the nuclear risk-reduction agenda in southern Asia. Leaders in China, India, and Pakistan have time before national and advanced theater missile defenses are deployed to take serious steps to reduce negative consequences and nuclear risks. The sooner they attend to these tasks, the better. In the meantime, Washington must also attend to the downside risks and unintended consequences in Asia of deploying missile defenses.

Missile Defenses and Nuclear Risk Reduction

Cold War models of nuclear risk reduction are only partly relevant to Asia. The Hotline agreement and other accords to prevent dangerous military practices could certainly be adapted to meet Asian circumstances. But the stabilizing aspects of strategic arms limitation and reduction accords, especially their codification of equality and intrusive monitoring provisions, are unlikely to be applicable to this region.

To begin with, national leaders in China, India, and Pakistan have publicly rejected equality and opted instead for "minimum" deterrence. The quasi-official "draft" Indian nuclear doctrine is characterized as

> a dynamic concept related to the strategic environment, technological imperatives and the needs of national security. The actual size components, deployment, and employment of nuclear forces will be decided in the light of these factors.[3]

The nuclear postures adopted by China and Pakistan will also be sensitive to external factors. All three countries are unlikely to accept a codification of inequality at a time of great uncertainty about the requirements of nuclear deterrence against more powerful competitors. Moreover, all three are extremely leery of the degree of transparency for nuclear forces that would facilitate treaties or the stabilization of nuclear requirements. In China, subterfuge is an integral aspect of military art and strategic culture. As David Shambaugh has observed, China's military leaders have been socialized in a military institution and political culture that prizes discipline and secrecy—thus they do not appreciate the importance of defense transparency as a security-enhancing measure, and view foreign requests to improve it with suspicion. They refuse to join alliances or participate in joint military exercises with other nations, are reticent to institutionalize military cooperation beyond a superficial level, and are leery of multilateral security cooperation.[4]

India and Pakistan, like China, rely on opacity to cover military weakness or to increase force survivability. The acceptance of transparency to reduce nuclear danger usually comes much later, after states possessing nuclear weapons gain confidence in their deterrent. The United States and the Soviet Union did not accept on-site inspections of each other's nuclear forces until 1986, nearly three decades after first broaching the subject.

In the early stages of a nuclear competition, there are few verifiable data points to measure stability or asymmetry. Paradoxically, the inclination by India and Pakistan to foster stability by not maintaining nuclear forces at high states of readiness could make it harder to clarify baselines. To complicate matters further, technical monitoring capabilities in southern Asia are limited, making it difficult to verify in a timely and repetitive fashion, nuclear developments across borders. China and India have invested in "national technical means" to observe military developments from space. Not to be left too far behind, Islamabad has used the launch services of Russia to loft a rudimentary observation satellite.[5] All three states will presumably rely, as well, on imagery purchases from commercial observation satellites to monitor developments of interest.

China, India, and Pakistan will also rely on domestic intelligence assessments, espionage, declassified U.S. assessments or leaks of classified material in the U.S. media, nongovernmental reports, or some combination thereof to produce national estimates. These sources might well produce a confusing picture, or reinforce worst-case analysis. National intelligence assessments might well be wide of the mark, producing unpleasant surprises. Strategic surprise is not uncommon in southern Asia: India surprised China with its nuclear tests in 1998; China surprised India by going to war in 1962; and Pakistan surprised India by crossing the Line of Control dividing Kashmir after the 1999 Lahore summit. Future surprises may also be in store.

Taken together, the imbalanced triangular relationship in southern Asia, the lack of hard information and redundant monitoring capabilities, and the perceived necessity for opacity could inflate force-sizing requirements in China, India, and Pakistan—even in the absence of missile defense

deployments by the United States. National leaders will certainly be hard pressed to maintain strict limits on their nuclear deterrents when domestic political, institutional, and technological pulls reinforce external drivers pointing toward more and better nuclear capabilities.

China and Cascading Nuclear Requirements

Beijing's calculations of nuclear sufficiency will reverberate in New Delhi, and India's recalibrated nuclear requirements will reverberate in Islamabad. At the top of this cascade, Beijing's calculations will be affected by U.S. deployments of national and advanced theater missile defenses. Whatever additional requirements Beijing feels are warranted to counter U.S. missile defense programs are likely to be relatively inconsequential in terms of the U.S.–China nuclear equation, but could be compelling on the Subcontinent. The potential for cascading nuclear requirements would exist, however, even in the absence of U.S. missile defense programs, since China's military and strategic modernization programs are driven in part by the Taiwan issue.

After the normalization of U.S.–China relations begun in the Nixon administration, stability across the Taiwan Strait rested on three pillars: Beijing's inability to project military power, Taipei's disinterest in distancing itself further from the mainland, and Washington's acceptance of the status quo relationship between Taiwan and China. These pillars began to erode well before the Clinton administration began to consider seriously national missile defense deployments. As political and demographic trends in Taiwan created greater distance from China's orbit, Beijing countered by improving its power projection capabilities.

Missiles were a relatively quick, inexpensive, and highly symbolic way to demonstrate cross-strait military capabilities. Predictably, China's missile programs prompted more support for missile defenses in the United States, more interest in Taiwan for transfers of new missile defense systems, and stronger drum beats on Capitol Hill in support of Taiwan's fledgling democracy. Beijing's leadership was willing to accept these consequences, given its inability to project military power in any way other than by ballistic missiles, and given its perceived need to "send a message" to Taiwan.

The growing distance between Taipei and Beijing, the multiple weaknesses of the People's Liberation Army, Navy, and Air Force, as well as new uncertainties about Washington's future course, meant that China required not only a demonstrable increase in missiles that could span the Taiwan Strait, but also modernized missiles that could range over intercontinental distances. In the event of a future crisis over Taiwan, Beijing's leadership is resolved never again to be subject to coercive U.S. nuclear diplomacy, as was the case during the 1950s, especially during the Korean War.[6]

The lesson learned by Mao Tsetung from U.S. nuclear threats was clear: "If we are not to be bullied in the present day world, we cannot do without the [atomic] bomb."[7] This lesson has been internalized by China's military

leaders. Marshall Nie Rongzen wrote,

> To get rid of imperialist bullying which China had suffered for more than a century, we had to develop these sophisticated [nuclear] weapons. At least then, we could effectively counterattack if China were subject to imperialist nuclear attack.[8]

Major General Yuan Huan wrote in a similar vein, "China's strategic nuclear weapons were developed because of the belief that hegemonic power will continue to use nuclear threats and nuclear blackmail."[9]

The most cost-effective way for China to prevent coercive U.S. nuclear diplomacy is to be able to destroy American cities, a requirement that is far easier to meet in the absence of U.S. missile defenses. In order to be viable, China's nuclear deterrent must be survivable. This, in turn, requires modern intercontinental ballistic missiles—solid-fueled missiles and that are mobile, and hard to find and target. If Washington deploys national missile defenses, Beijing's deterrent must be able to penetrate them. Warheads must be accompanied by countermeasures that can confuse and foil U.S. intercepts.

Beijing previously assumed a rather relaxed view about nuclear deterrence. Throughout the Cold War, China's strategic nuclear forces were both negligible and surprisingly vulnerable. Beijing was content to possess perhaps 20 intercontinental ballistic missiles that took many hours to become operational, one nonoperational submarine carrying missiles that could not reach the United States, and no strategic bombers. Whether China's leaders realized it or not, they were vulnerable to a U.S. first strike.[10] The vulnerability of Beijing's strategic nuclear forces and the enormous asymmetry between Chinese and U.S. nuclear capabilities did not matter as long as the status quo on Taiwan held firm, and as long as both countries—as well as Taiwan—were content not to change it.

These central determinants of strategic stability are in flux. The combination of Taiwan's drift from the mainland, the acquisition of advanced conventional capabilities by U.S. forces, and Washington's renewed interest in ballistic missile defenses poses a triple threat to China. Beijing's vulnerable strategic deterrent is now clearly insufficient in the event of a confrontation over Taiwan, its ability to coerce Taiwan is being challenged, and its economic development is being taxed, since extra funding for conventional and nuclear forces comes at the expense of domestic priorities, which are essential for economic growth and social cohesion. Nonetheless, Chinese leaders are prepared to direct unprecedented funding increases to the military, reflecting the importance they attach to the Taiwan issue and the concerns they feel about growing asymmetries in Chinese and U.S. military capabilities.[11] As a consequence, one close China watcher believes

> From the late 1980s on, Chinese strategists have developed a concept of "limited deterrence" (*you xian wei she*) to describe the kind of deterrent China ought to have. While the concept is still evolving, limited deterrence, according to Chinese strategists, requires sufficient counterforce and countervalue

> tactical, theater, and strategic nuclear forces to deter the escalation of conventional or nuclear war. If deterrence fails, this capability should be sufficient to control and to compel the enemy to back down.[12]

Not surprisingly, Beijing has been the most vocal opponent of U.S. missile defense programs, far surpassing Moscow in the intensity of its criticism. Pakistani leaders have also reacted quite negatively to prospective missile defenses, not simply in support of Beijing, but also out of concern that New Delhi will eventually deploy its own defenses, possibly negating Islamabad's investment in missiles. New Delhi's diplomatic posture toward missile defenses has shifted from negative to neutral. Early in the Clinton administration, when ties were strained, Indian diplomats derided missile defenses as yet another ill-conceived strategic initiative by an insular and unilateralist Washington. As Indo-U.S. relations improved, criticism toward missile defenses became greatly muted, with some even contemplating active bilateral cooperation in this sphere.[13] At the outset of the administration of George W. Bush, New Delhi's response to presidential pronouncements on strategic policy was far more appreciative than official responses from European capitals.

While New Delhi's views toward missile defenses shifted, Beijing's opposition deepened. Prospective U.S. missile defense deployments reinforced anxieties over the future of Taiwan and the "revolution in military affairs," which has hollowed out the People's Liberation Army's oversized and outdated conventional forces. These concerns will be reflected by China's strategic modernization effort, which will then have cascading impacts on Indian threat perceptions and force requirements. The extent of the resulting cascade would depend, in part, on how China's leaders define the requirements of deterrence against the United States (and lesser cases), how U.S. leaders define the extent and architecture of ballistic missile defenses, and how much India's leaders feel compelled to respond to Chinese moves.

There is broad agreement in the United States regarding China's presumed requirements for deterrence. This near-consensus view was stated in the Pentagon's 2001 review of proliferation dangers: "China's stated doctrine reportedly calls for a survivable long-range missile force that can hold a significant portion of the U.S. population at risk in a retaliatory strike."[14] Some who support missile defenses would seek to negate this capability; those who seek a cooperative relationship with Beijing would accept a mutual deterrence relationship. If negation of the Chinese deterrent is either sought or perceived, China's strategic modernization programs are likely to expand accordingly, as will their cascade effects on the Subcontinent.

Given the low priority China's leaders have attached to nuclear deterrence in the past and the higher priority given to conventional force modernization and to economic development, Beijing will seek to fulfill the requirement of targeting U.S. cities at least cost. China's minimalist requirements continue to be reflected in official U.S. projections of Beijing's strategic modernization plans. According to estimates offered by the Pentagon and the Central Intelligence Agency, China will likely have "tens to several tens of missiles"

capable of reaching the United States by 2015.[15] A January 2002 CIA estimate revised upward China's requirements, predicting between 75 and 100 warheads on ocean-spanning missiles by 2015. Moreover, the U.S. intelligence community estimated that Beijing would "encounter significant technical hurdles" as well as financial costs trying to place multiple warheads atop its mobile missiles.[16] In other words, Beijing would deploy, on average, only six warheads atop intercontinental ballistic missiles per year in response to U.S. national missile defense deployments. This is an extraordinarily low estimate for government agencies that have not been known to deflate the military potential of a prospective strategic competitor.

Depending on the scope of "limited" U.S. national missile defenses that are ostensibly oriented against North Korea, Iran, and Iraq, U.S. deployments could also be able to "capture" China's quite modest nuclear deterrent. If the prospective size of "limited" U.S. missile defense deployments exceeds the intelligence community's estimates of the Chinese strategic nuclear deterrent in 2015, Beijing will presume that China is the real object of U.S. defense planning. Beijing is unlikely to sit still if Washington seeks to neutralize its nuclear deterrent. As a consequence, the pace and extent of China's strategic modernization effort are likely to increase alongside the breadth of prospective U.S. missile defense deployments. Several nongovernmental studies are less sanguine than the U.S. intelligence community about Beijing's missile plans, predicting force increases from tens to hundreds of missiles.[17] An increase by China of this magnitude could have significant cascading effects in India and Pakistan. It would also create perturbations in Japan and Taiwan. Thus, the prospective size of the "limited" U.S. national missile defense system matters greatly.

With the removal of treaty constraints against missile defenses, these limits will be bounded primarily by U.S. executive branch and legislative interactions. Beijing will unwillingly become a party to American choices, since its responses to U.S. deployments will establish a feedback loop for missile defense enthusiasts and skeptics. If ambitious U.S. missile defense plans alienate Beijing, Moscow, and allied capitals, while appearing to be linked to the resumption of nuclear testing and the weaponization of space, domestic blocking action is likely to be taken. If, on the other hand, China again resorts to the use of ballistic missiles for coercive diplomacy or, worse, in a military campaign against Taiwan, national missile defenses will receive a significant boost. Even if Washington makes wise decisions regarding ballistic missile defense deployments, Beijing could make poor ones resulting in increased tensions, instability and armament around its periphery.

Given the importance Beijing's leaders attach to the Taiwan issue and still-raw memories of U.S. nuclear coercion, China has already begun a strategic modernization program, albeit one that has proceeded very slowly. A trickle-down effect on South Asia is already underway, but it has yet to become a cascade. The extent of acceleration will depend, in the first instance, on decisions taken in Washington and Beijing. Beijing cannot be given a veto over national missile defenses or for advanced theater defenses provided to

friends and allies, but neither should Washington be given encouragement to make bad decisions. The dilemmas associated with missile defense deployments are inescapable, and they have as much to do with minimizing downside risks and unintended consequences as with pursuing favorable outcomes.

India's Nuclear Choices

New Delhi's nuclear choices are different from those driving Beijing, but they are also susceptible to reverberations generated from missile defense deployments. India's nuclear requirements flow from two colluding nuclear neighbors, considerations of status and domestic politics, and the prompting of a well-connected "strategic enclave."[18] The Indian nuclear program has its own biorhythms, however, which are extremely relaxed by western standards. The most extraordinary data point in this regard is the 24 year hiatus between India's nuclear detonations.

Several reasons could be posited for this elongated time line for developing a nuclear arsenal, including the high priority Indian leaders have given to economic concerns; their past susceptibility to U.S. pressure; a strong aversion by Indian political leaders to make difficult choices; the absence of an indigenous national security consciousness and support structure in New Delhi; and the powerful lassitude and risk aversion of the Indian bureaucracy. To these must be added a unique duality among Indian elites toward the Bomb, in which status consciousness and anticolonialism point in one direction, while moral superiority and antinuclear Gandhianism point in the other. One chronicler of India's bomb program, George Perkovich, characterizes this odd mix as "defiant assertiveness and diffident timidity."[19]

Indian singularity could comfortably support both pro- and antinuclear postures, since either path made India special. As a proud Third World state speaking from uncommon moral authority, New Delhi relished leading international campaigns for nuclear disarmament. But India also privately longed to be a member of this exclusive club. Ongoing nuclear and missile programs in China and Pakistan, the indefinite extension of the Nuclear Non-Proliferation Treaty in 1995, and the 1996 negotiation of the CTBT all served to clarify the necessity for choice. The divide between nuclear and nonnuclear-weapon states was now clearer than ever. A newly elected government led by the Hindu nationalist Bharatiya Janata Party, operating with a bare parliamentary majority, definitively resolved India's ambivalence with five nuclear weapon tests in May 1998.[20]

The Prime Minister of this coalition government, A.B. Vajpayee, spoke few words about India's nuclear ambitions since announcing the tests. Official pronouncements dwell on the guiding principles of minimalism with respect to the requirements of nuclear deterrence and a pledge of no-first-use that appears to be unconditional.[21] In lieu of more elaborate statements regarding the requirements of nuclear deterrence, the Vajpayee government assembled an eclectic group of advisors to draft a nonofficial, but officially sanctioned statement of India's nuclear needs. The August 1999 report by

the National Security Advisory Board conveys authoritativeness, since it asserts, rather than recommends doctrine (e.g., "India's nuclear forces will be effective, enduring, diverse, flexible, and responsive . . .").

This semi-official and yet quasi-deniable report is certainly unique in national efforts to fashion a nuclear doctrine. The report's release was accompanied by a government invitation for public engagement, furthering the consensus-building effort begun with the diversity of the report's drafting group. The drafters appeared to have built internal consensus by endorsing a wide range of initiatives, including the need for a nuclear triad of capabilities held by India's Army, Navy, and Air Force. Some of the asserted needs, such as organizing India's deterrent for "rapid punitive response" vitiate India's reassuring principle of no-first-use, since a force ready to respond quickly would look indistinguishable from one preparing to launch a preemptive strike. The core requirement is stated as "credible minimum nuclear deterrence." The demands of credibility, however, can influence the minimum required. A high premium is placed on survivability to lend credence to India's retaliatory force posture.[22]

The advisory board said nothing about the requirement, role, or repercussions of ballistic missile defenses for India's national security. Nor did the advisory board's report provide insight into how India might react to an increase in China's nuclear capabilities as a result of missile defense deployments by the United States. In any event, the incremental requirements resulting from missile defenses would be hard to discern, since the advisory board endorsed such a robust triad of nuclear capabilities. Presumably, however, those advisors who supported a large arsenal would support an even larger one after factoring in the cascade effects of missile defenses.

The absence of official Indian government statements regarding the requirements of nuclear deterrence was not unwelcome to foreign capitals that preferred ambiguity to firmly stated, ambitious estimates of India's nuclear needs. Filling this vacuum were Indian strategic analysts who offered their own unofficial estimates of the requirements of deterrence. One notably hawkish author called for an "escalation dominance" posture against China and at least 300 nuclear weapons.[23] Another hawkish strategist places the stockpile requirement at 132 devices.[24]

The dean of India's strategic analysts, K. Subramanyam, estimated the need for 60 deliverable weapons, but this was before China's strategic modernization program began to take shape.[25] Writing soon after the 1998 nuclear tests, when Western concerns were quite elevated, the head of India's government-supported institute of defense studies, Jasjit Singh, wrote,

> . . . it is difficult to visualize an arsenal with anything more than a double-digit quantum of warheads. It may be prudent to even plan on the basis of a lower figure of say, two–three dozen nuclear warheads by the end of ten–fifteen years . . . with the passage of time, deterrence decay factors will lead to a smaller arsenal rather than a larger one.[26]

This estimate now appears unrealistically low. A subsequent assessment by retired Admiral Raja Menon calculated that India should eventually rely upon a deterrent capability of six submarines, each carrying as many as ninety-six

warheads.[27] Another retired senior military officer, Kapil Kak, called for an initial force for 100 warheads carried by aircraft and land-based missiles.[28]

These unofficial assessments, together with the advisory board's report, suggest some clues as to how the Indian government might translate minimum nuclear deterrence into numbers—at least in the absence of cascade effects. The community of strategic commentators in India that pushed for an overt nuclear capability, and others who have joined them since the 1998 blasts, mostly translate the requirements of nuclear deterrence and the prerequisites of great power status into a thermonuclear weapons capability and a three-digit sized force of nuclear weapons.

The Indian government has also refrained from publicly discussing nuclear targeting, and the National Security Advisory Board provides no elucidation on this subject. Private commentators, mostly with military backgrounds, have again filled this void. Vijay Nair postulates that deterrence against China would translate into strikes against four to five metropolitan areas, nine to ten "strategic industrial centers" and China's submarine bases. As for Pakistan, Nair suggests targeting six to ten cities and a lesser set of communication nodes.[29] Raja Menon promotes a "flexible response" nuclear posture that targets military sites instead of cities.[30] Bharat Karnad advocates striking enemy cities and the development of high-yield thermonuclear weapons.[31]

The targeting of cities poses dilemmas for the stronger state in any nuclear pairing, and Indian government officials are likely to recoil from "countervalue" strikes against Pakistani cities unless Indian urban centers are hit first. In addition, countervalue targeting runs against the grain of Indian strategic culture. India's wars with Pakistan have been quite restrained by western standards, and have almost entirely avoided the targeting of military assets in built-up areas.[32]

To the extent that Indian officials venture beyond the targeting of cities, they expand the parameters of minimal nuclear deterrence. A close U.S. observer of India's evolving nuclear plans, Ashley J. Tellis, believes that New Delhi's requirements are likely to remain limited, following the cardinal principle that nuclear weapons are political, and not war-fighting instruments. Tellis concludes that India will maintain a modest "force in being," a deterrent "consisting of available, but dispersed, components that are constituted into a useable weapon system primarily during a supreme emergency."[33] He estimates that India's nuclear inventory is not likely to exceed 150–175 weapons by the year 2010.[34] This sanguine assessment still leaves open the door to increased targeting requirements as India's capabilities grow, providing for "more flexible responses in order to ensure that punishment, whenever inflicted, can be proportional and leads to speedy conflict termination at the most minimal cost."[35] Nuclear strategists in the West know all about this slippery slope and where it can lead.

The "second tier" of nuclear weapon states—China, Great Britain, and France—are assumed to have nuclear weapon stockpiles in the low hundreds, which could set a marker for Indian ambitions. A British expert deeply steeped in western practices of nuclear deterrence, Michael Quinlan, finds it "difficult to believe" that India's requirements "could justifiably reach any higher than

the smallest of the five 'NPT' nuclear armories (the United Kingdom's, at an announced maximum of below 200 operational warheads)."[36] This might be wishful thinking, however, since New Delhi's security dilemmas are far greater than those facing London or Paris. In addition, a status-conscious India might well be averse to establishing a third nuclear tier below Great Britain and France, and might even be inclined to supercede the "colonialist" rung on the nuclear ladder. A three-digit sized Indian nuclear force would be directed mostly against China, while covering the lesser case of deterring Pakistan. The aspiration by India's nuclear hawks for a three-digit sized nuclear capability might well be inflated but, at present, theirs is the dominant discourse in India. Needless to say, these public aspirations help shape Chinese and Pakistani considerations of their own nuclear needs.

PAKISTAN'S DILEMMAS

Most scenarios for nuclear danger on the Subcontinent begin at the Line of Control (LoC) dividing Kashmir. The staging areas for carrying out deadly operations against Indian targets are on Pakistan's side of the Kashmir divide where, for many years, jihadis received logistical, intelligence, fire control, and material support from the Pakistani Army and intelligence services. During the Pakistani-backed Kashmir insurgency, firefights between Indian and Pakistani forces along the LoC have been frequent occurrences, sometimes accompanied by the overrunning of border posts. The war against terrorism in Afghanistan has greatly complicated Pakistan's Kashmir policy, which relied to a considerable extent on jihadi operations to punish Indian security forces and to draw international attention to its concerns.

Islamabad champions a strategic restraint regime for South Asia alongside its proactive Kashmir policy. Different Pakistani military and intelligence officers worked on the nuclear and Kashmir accounts. Prior to the war against terrorism in Afghanistan, the contradictions inherent in the twin pursuits of nuclear risk management and fomenting violence in Kashmir were either not well appreciated at General Headquarters or believed to be manageable. During the first decade of offsetting nuclear capabilities in South Asia, Pakistani governments were reluctant to allow too much forward progress on nuclear risk reduction in the absence of satisfaction on Kashmir, viewing one as leverage for the other. Progress in resolving the Kashmir dispute, however, was publicly characterized in zero-sum terms, with the enumeration of Indian wrongs becoming a unifying theme in national life.

Pakistan's parallel pursuit of a strategic restraint regime and a proactive Kashmir policy became a casualty in the post–September 11, 2001 war against terrorism. Prior to September 11, Pakistani governments had previously hidden behind the argument that their support for militant Islamic groups was merely moral and political. The burden of proof needed to expose this fiction—the public use of intelligence to demonstrate military ties—was incidentally met during the U.S. military campaign against the Taliban. Many of these "student" warriors received religious and military

training from Pakistani mentors. Plausible deniability was now replaced by a presumption of guilt, not only in Afghanistan, but also in Kashmir. Every new act of terror committed by groups that received training and other forms of military assistance from Pakistan became an embarrassment to Islamabad.

By continuing to support jihadi crossings of the Kashmir divide, Pakistan could no longer expect the sympathy of the international community. To the contrary, after September 11, 2001, Islamabad could only expect diplomatic support and protection if it appeared to be moving against jihadi groups. This new dynamic became apparent after a suicide squad of Islamic extremists once backed by Pakistani intelligence outfits attacked the Indian parliament building three months after the World Trade Center collapsed in flames. The government of Pakistani President Pervez Musharraf plausibly argued that it had no role in the attack against the Parliament, but could only prove this point by taking further steps against jihadi groups that previously received official sanction.

Prior to the war against terrorism in Afghanistan, Islamabad's Kashmir diplomacy rested on the expectation that India would be restrained from crossing the LoC to retaliate against terrorist acts, due to concerns over escalation and New Delhi's sensitivity to negative international reaction. After the terrorist attack on the Parliament, the Indian government placed its army on a war footing, announcing that it would not be paralyzed by Pakistan's nuclear deterrent, and that limited war was a viable military option to stop terrorist attacks.[37] The "rules of the game" in the Kashmir dispute are changing, reinforcing Pakistan's commitment to compete with India's nuclear programs.

During the first decade of offsetting nuclear capabilities in South Asia, Pakistan's nuclear diplomacy was constructed around initiatives offered in the confident expectation of their rejection by India. Indeed, India's acceptance of Pakistan's previous proposals for nuclear abolition, if faithfully and bilaterally implemented, would pose serious dilemmas to Islamabad, the weaker state. Consequently, Pakistani proposals for nuclear disarmament have increasingly been mated to proposals for mutual, disproportionate reductions in conventional military capabilities. As Tanvir Ahmad Khan, a retired senior Pakistani diplomat has noted,

> We are frequently asked by international experts as to what would set Pakistan on the risk-reduction route. Essentially, the answer lies in addressing Pakistan's primary concerns. First, progress towards conflict resolution . . . . Secondly, the quest for confidence-building measures in the conventional field needs to be intensified. Particularly significant in this regard would be verifiable reduction in the asymmetry of the capability to make pre-emptive strikes . . . .[38]

These proposals are also unlikely to be realized, since India's conventional military requirements must take into account Chinese as well as Pakistani contingencies.

The dance of diplomatic one-upsmanship continued after the 1998 nuclear tests and the 1999 high-altitude war in Kashmir. Pakistan's proposals for nuclear risk reduction and stabilization measures were explicitly linked to the escalatory potential inherent in the Kashmir dispute. Islamabad's nuclear diplomacy became broader and more nuanced after the nuclear tests, centering around the need for a "nuclear restraint regime" that included prohibitions on deployed nuclear forces and missile defenses.

Michael Quinlan reasoned that India was not "within sight [of a preemptive option], or could so render itself for decades ahead, or possessing such an option to a standard which military advisers could recommend to leaders."[39] Pakistan's generals confidently endorse this view. Troubling realities lurk below this surface, however. Pakistan has less than two-dozen airfields from which to operate nuclear-capable aircraft. Its missile production, main operating bases, and nuclear facilities are very few in number, and their geographical coordinates are publicly known. Commercial satellite images of Pakistan's facilities can be found on the Internet, along with the particulars of its missile programs.[40]

Quinlan's qualification still has merit. Even if the case for preemption were strongly made, it is difficult to envision an Indian prime minister believing and acting upon an assurance of complete success. Nonetheless, Pakistan's confidence in the survivability of its nuclear deterrent is likely to degrade in crisis situations, given the quick reach of Indian strike forces. Consequently, there are strong incentives for Pakistani military leaders to increase the readiness of their nuclear deterrent in periods of mounting tension, as they have in the past.[41] The potential for accidents and miscalculations grows when missiles are moved or are placed on heightened alert.

By championing the non-deployment of nuclear forces, Pakistan seeks to protect its deterrent. If faithfully adopted, however, this proposal could increase Islamabad's vulnerability to preemption, given the extremely short flight times between northern India and Pakistan's strategic assets. Pakistan's custodians of the nuclear option could, of course, define "non-deployment" in permissive ways. (The oft-used, official Indian idiom of "inducting" nuclear forces lends itself to an equally wide latitude of interpretation.) Because Pakistan lacks strategic depth, it might well "deploy" a portion of its deterrent in unorthodox ways, distant from main operating bases.

There are several precedents for unorthodox basing. China, for example, maintains some of its missiles in caves, where they could be moved surreptitiously to confound targeting. The Soviet Union also used caves blasted out of the shoreline to protect missile-carrying submarines.[42] Pakistan could well resort to similar hide-and-seek practices. But moves to provide safety against a surprise attack could also generate a very different set of dangers, including accidents and breakdowns of command and control. Missiles located at satellite deployment areas away from main operating bases might also require movement in deep crisis, generating alarms (if detected) and prompting dangerous countermoves if undetected but presumed. The movement of Pakistani missiles operating on poor roadways poses safety concerns, especially

if the missiles in transit use highly combustible, liquid fuel. If a nuclear-related accident occurs in a deep crisis, it could trigger unforeseen consequences if enemy action is the presumed cause.

Pakistan faces additional security dilemmas. The Sunni-Shia fault line within Islam is situated along Pakistan's border with Iran. Islamabad has had minor flare-ups with Teheran in the past, which both capitals have chosen not to overemphasize, given their other, more serious security concerns. Iran's quest for nuclear and missile capabilities would complicate regional security matters for Pakistan, creating a two-front nuclear danger—much like that facing India.

Pakistan's border with Afghanistan was supposed to provide strategic depth and a gateway to the markets of Central Asia, but Islamabad's efforts to shape Afghanistan's future by means of the Taliban proved to be a poor choice. What began as a low-cost plan to ensure a friendly border and to facilitate a jihad in Kashmir evolved into diplomatic isolation and domestic woes.[43] A Taliban-led government that President Musharraf deemed essential to Pakistan's well being in March 2001[44] became a huge liability six months later after the demolition of the World Trade Center by Osama bin Laden's recruits. With the U.S. declaration of war against terrorism in Afghanistan, Pakistan was forced to improvise an extrication strategy designed to prevent yet another hostile government along its borders.

Amidst these difficulties, Pakistan's friendship with China became increasingly essential to national well being, helping greatly to offset India's strategic advantages and to keep New Delhi off balance. China's assistance for Pakistan's missile programs continues despite Beijing's concerns over Islamic militancy along its western borderlands. Pakistan's other major external source of missile-related equipment, North Korea, is decreasing in importance, since Pakistan's clear preference is mobile, solid-fueled missiles, not the liquid models that North Korea has provided. If Pyongyang and Washington reach nonproliferation accords, the missile pipeline from North Korea would close, in any event.

While Pakistan's challenges come from all azimuths, its most serious problems remain social, political, and economic in nature. Pakistan's domestic difficulties could lend force to official pronouncements that Islamabad does not intend to engage in a nuclear competition with New Delhi. Nevertheless, Pakistan's army, which oversees nuclear and missile efforts, has invested heavily in these pursuits and is acutely aware of India's growing conventional capabilities. To hold costs and gain greater managerial control over duplicate nuclear and missile laboratories, a reorganization was announced by the Musharraf government in March 2001. Nonetheless, Pakistan is likely to define minimal nuclear deterrence in relative, not minimal, terms. "Pakistan's nuclear policy is," as Samina Ahmed has noted, "reactive in nature, responding to India's nuclear ambitions . . . . Pakistan's nuclear directions will be determined by India's nuclear choices."[45] If India increases its nuclear and missile capabilities, Pakistan's requirements are likely to be adjusted upward. While India's nuclear infrastructure and financial means are

far greater, Pakistan has spared no effort to compete in this realm. With sufficient time and effort, however, New Delhi can pull away from Islamabad, particularly if the combined nuclear threat from China and Pakistan appears to warrant doing so.

FORCE SIZING CONSIDERATIONS

Nuclear force-sizing calculations between China and India will be determined by the interplay of crosscutting pressures. Unlike the Cold War competition between the United States and the Soviet Union, domestic factors are, on balance, likely to depress nuclear needs. External drivers point in the opposite direction. On the inflationary side, New Delhi's declared test of a thermonuclear device and its quest for an extended-range missile able to reach Beijing and Shanghai send clear messages to the Chinese leadership. Every flight-test of the extended-range Agni-III ballistic missile would confirm a Chinese orientation for India's nuclear deterrent. The perceived need for thermonuclear weapons to deter China is relatively new in Indian strategic discourse, and did not play a prominent role in the push for a resumption of nuclear testing in the 1990s. In effect, a debate over thermonuclear weapons was preempted by the 1998 test series, which, according to Indian government officials, included one such detonation. If additional "China-specific" nuclear tests are required to confirm a thermonuclear weapon design, Beijing's feigned indifference to Indian nuclear and missile programs would become increasingly strained.

Indian nuclear scientists have expressed divided views as to whether the thermonuclear test was a complete success, as asserted by government officials. Outside observers have their doubts.[46] The Government of India has notably declined to sign the CTBT, leaving open the possibility of a resumption of tests to confirm a more advanced nuclear capability. China has signed, but not ratified the Test Ban Treaty, a constraining factor for Beijing, both in its dealings with a rising India and with prospective U.S. missile defenses. If China seeks to assert a hierarchical nuclear posture against an India armed with thermonuclear weapons and extended-range missiles, it could do so without testing by ratcheting up its inventories of deployed launchers and nuclear weapons. Or China, along with other states, could resume nuclear testing.

During the Cold War, China was largely disinterested in strategic modernization programs. With rising concerns over Taiwan and U.S. missile defense deployments, Beijing has belatedly embraced some of the requirements of nuclear deterrence long propounded in the West.[47] Chinese calculations are now compounded by India's ambitions and nuclear-status consciousness. If the Government of India appears to be embracing a three-digit sized nuclear capability—either through veiled public statements or through the trajectory of its programs—China is likely to see this bid, and raise it. Doing so would not merely constitute a hierarchical response, but would also reflect China's strategic concerns within and beyond the Subcontinent.

If China and India both appear headed for three-digit sized nuclear capabilities, one key question is what portion of these capabilities would be deployed. Another is what the first integer of the three digits would be for both countries. Nongovernmental analysts estimated that, at the turn of the century, China's nuclear arsenal consisted of 300–400 warheads, with very few, if any, deployed on a day-to-day basis.[48] Most of this arsenal appears geared toward regional warfare. These estimates are admittedly sketchy; given Beijing's commitment to nuclear opacity, they could well be wide of the mark.

The first integer of China's three-digit sized nuclear inventory will be determined, in large measure, by the strategic environment around China's periphery, by Beijing's economic circumstances, and by the architecture and extent of U.S. national missile defenses. The more limited the U.S. deployment, the more likely it is to depress China's nuclear needs. If U.S. national missile defense deployments suggest an attempt to negate China's nuclear deterrent, Beijing's nuclear requirements would rise accordingly. In addition, the more extensive the deployment of U.S. national missile defenses, the more Beijing would seek to solve the technical problems associated with placing multiple warheads atop its mobile missiles, perhaps with Russian assistance. The deployment of space-based interceptors as part of the U.S. architecture for ballistic missile defenses would be profoundly disturbing to China, as would other U.S. programs for space warfare. Beijing's options to counter U.S. military dominance might well include the accelerated development of antisatellite weapons and other asymmetric responses.[49]

Perhaps the most noteworthy aspect of the China–India nuclear equation is the number of significant uncertainties that could affect force-sizing calculations. India would be more sensitive to increases in China's nuclear forces associated with regional targets than with a buildup directed against the United States. One response by Beijing does not necessarily preclude the other, however. Bilateral relations between India and China and between India and Pakistan have oscillated, as have U.S. ties with all three countries. The Taiwan issue and prospective U.S. missile defense deployments add volatility to this mix. There are too many critical variables to predict with confidence how the Chinese-Indian nuclear equation will unfold. If any of these external drivers become more worrisome, nuclear requirements will point upward.

During the Cold War, the United States and the Soviet Union were stuck determining nuclear force requirements in relative terms. Powerful domestic constituencies mandated that actual or perceived "second place" was unacceptable in the nuclear arms race. The twin impulses of seeking relative advantage and avoiding disadvantage generated huge arsenals and targeting lists. The second rank of nuclear powers during the Cold War avoided this perverse dynamic. For example, the leaders of Great Britain and France concluded that a small number of missile-carrying submarines at sea would suffice to overwhelm the 100 or fewer nuclear-armed missile defense interceptors erected around Moscow.[50]

Similarly, China, India, and Pakistan all retain a strong interest in holding down nuclear force levels. But none of these states will be inclined to establish fixed requirements for minimal nuclear deterrence, given external uncertainties. With external prodding, minimal requirements could be defined in relative ways. This would constitute a dramatic shift for China, which was, by far, the most relaxed nuclear weapon state during the Cold War. And if Beijing ratchets up its capabilities, domestic pressures and interest groups within India will push in a similar direction. Pakistan has the infrastructure to compete with India, as long as nuclear and missile programs remain high budgetary priorities. The more Pakistan's military falls behind Indian conventional capabilities, the more it will be tempted to rely on nuclear weapons as an "equalizer." External drivers could come from the bottom up, the top down, or from the status-conscious middle power, India.

A competitive, "tit-for-tat" dynamic already exists on the Subcontinent, as was evident after India carried out five nuclear tests in 1998, prompting Pakistan to claim a higher number of detonations. Another indicator is Pakistan's decision to extend the reach of its missiles beyond New Delhi. Since India can cover all of its neighbor's cities with missile strikes, Pakistan has decided that it, too, must be able to target urban areas in India's south. The opacity of nuclear and missile programs could prompt national leaders to build in "safety" factors in determining requirements. And, to the extent that nuclear capabilities are equated with status as well as deterrence, further impetus to nuclear-related programs could be generated either by the loss of status in nonnuclear domains, or by falling behind in the strategic competition.

Moderating Factors

In South Asia, troubling developments are usually intermixed with hopeful signs. While there is considerable potential for China, India, and Pakistan to become enmeshed in an open-ended nuclear competition, there are also moderating factors within each country that could mitigate negative effects. To begin with, all three states have considerable financial constraints or opportunity costs associated with extensive nuclear modernization. Pakistan's economic forecast is clouded by heavy military expenditures and foreign debt. If Pakistan's military leaders seek to keep pace with India's nuclear and missile programs, conventional military capabilities could suffer along with the national economy. While the Pakistani Army's leadership strongly supports nuclear and missile programs, that support could wane in the future when such funding competes against the Army's other institutional interests.

Even India and China, which could support increased spending for conventional as well as nuclear programs, must seriously consider the opportunity costs of doing so. Although New Delhi's military budgets spiked after the 1999 high-altitude war with Pakistan, sustained growth in Indian defense spending is a rare occurrence. Chinese defense spending also increased significantly in the 1990s, but a growing economy remains the top priority

of Beijing's leaders. Without it, they face domestic threats far greater than the external problems posed by U.S. ballistic missile defenses. Much of the added defense spending in both China and India goes to improve the rewards of military service and to replace outmoded tanks, planes, and ships. The expense of strategic modernization programs must be weighed against these priorities.

The Soviet experience of overspending for national defense is clearly within the Chinese field of view. While the scope of China's strategic modernization efforts would depend greatly on the ambitions U.S. officials attach to missile defense programs, Beijing's national security imperative would remain constant—to counter missile defenses and to maintain credible deterrence at least cost. As a leading Chinese arms-control official has stated, "We will do whatever possible to ensure that our security will not be compromised, and we are confident that we can succeed without an arms race." The cheapest counter to missile defenses, in this view, is to attack the system's most vulnerable parts.[51]

Beijing has had the good sense to avoid nuclear arms racing in the past, and is not likely to alter this behavior in the future. A significant increase in nuclear capabilities would not only complicate China's relations with India, but also with Japan, Russia, and elsewhere along its periphery. A major buildup in nuclear forces would also badly undercut Beijing's diplomatic offensive against missile defenses, while empowering the missile defense lobby in the United States. Consequently, if future U.S. administrations do not seek the negation of China's strategic deterrent, cascade effects on the Subcontinent could be greatly reduced.

The relaxed biorhythms of Indian nuclear modernization are also not easy to change, although external shocks, such as Pakistan's surprise crossing of the LoC in 1999, have done so in the past. Nonetheless, a bureaucratic and political culture that prizes the avoidance of decisive decisions does not change overnight.[52] In the past, powerful Indian civil servants and defense scientists have been loathe to share confidences with military leaders. This, too, has begun to change. Operational and command and control imperatives will require India to confront difficult issues of civil–military relations. Moreover, nuclear issues are politicized in India's hyper-democracy, another constraint on pacing. The Vajpayee government did not take the Congress Party and other opposition groups into confidence before deciding to test nuclear weapons, and they in turn do not feel beholden to support all aspects of the Vajpayee government's nuclear agenda. India's relaxed biorhythms have already quickened somewhat, but the deliberative pace of consequential Indian decision making remains an important moderating factor.

The public declarations of national leaders also constrain pacing, at least in a notional fashion. China doesn't deign to compete with India, and India doesn't deign to compete with Pakistan, at least in official statements. Public pronouncements could well be proven false, but they at least provide an opportunity to realize stability through asymmetry in the difficult passage ahead. Moreover, India's status consciousness could work in positive as well

as negative ways. New Delhi appears determined to demonstrate a far superior wisdom on nuclear matters than that evidenced during the Cold War. In particular, Indian strategists stress the importance of reassurance and affirmation of national pledges not to use nuclear weapons first against nuclear-armed opponents, and not to use them at all against nonnuclear-weapon states. India certainly has the strategic depth to maintain its nuclear holdings in a relaxed status and to take other steps clarifying a nonthreatening posture.

New Delhi has already taken positive steps in this regard. Senior Indian officials have publicly rejected "nuclear war-fighting" strategies and requirements. Foreign Minister Jaswant Singh explicitly undercut the draft Indian nuclear doctrine's requirements for prompt retaliatory capabilities noting,

> [W]e would like to convey a sense of assurance in our region, also beyond, so that our deployment posture is not perceived as destabilizing. We have rejected notions of 'launch on warning postures' that lead to maintaining hair trigger alerts, thus increasing the risks of an unauthorized launch.[53]

Government officials in India have also repeatedly stated that they intend to demonstrate their commitment to a no-first-use pledge through operational practices. In this regard, some short-range Prithvi missiles were moved from storage cites in central India to the border area near Pakistan in 1997, but were subsequently moved back.[54] This singular step is unlikely to be comforting to Pakistan, given the relative ease with which short-range missiles could be shuttled back to strike locations, as was reported in the war scare following the December 2001 attack on India's Parliament.[55] While crisis stability remains problematic in South Asia, in peacetime, New Delhi could provide reassurance to Pakistan, moderating their strategic competition and providing a model for others to follow.

Similarly, China and India could avoid expansive nuclear requirements, if other external drivers remain muted. Each country has strategic depth and is developing mobile, land-based missiles that the other cannot locate or destroy. Because preemption is not a viable option, "counterforce" targeting or "damage limitation" strategies of nuclear deterrence built around the ability to knock out military capabilities of the other side seem eminently avoidable. These concepts were significant drivers in the expansion of U.S. and Soviet targeting lists.

Alternatively, India and China could adopt a nuclear-targeting strategy of placing each other's cities at risk. Both countries have six cities with populations in excess of five million. While such a "countervalue" nuclear targeting strategy would not require many warheads, it places national leaders who would prefer more targeting options in a terrible vice.

The United States and Soviet Union "solved" these dilemmas by compiling thousands of targets, including military facilities, command and control bunkers, and war-supporting industries that happened to be located within or in close proximity to major metropolitan areas. This allowed national leaders to maintain the moral fiction of not targeting populations "*per se*," while

endorsing nuclear targeting plans that would still produce many millions of collateral deaths.[56] Indian and Chinese leaders might be disinterested in such deadly fictions. If, however, they reject both counterforce and countervalue targeting, what, exactly, would they place on their targeting lists?

The leadership in both countries (as well as in Pakistan) could use a demonstration nuclear detonation to signal the approach of an intolerable threshold, or they could use a nuclear strike against an infrastructure project that could result in devastating economic consequences. It does not take many nuclear weapons for such demonstrative purposes. And if one nuclear detonation leads to a second, what then? Cold War nuclear strategists tried mightily to define multiple escalation rungs and to establish escalation dominance capabilities,[57] but these were not very helpful or convincing to political leaders caught in the crucible of an intense crisis. Indian and Chinese leaders are likely to react no differently in this respect than their U.S. or Soviet counterparts.

Pakistani leaders do not have the luxury of strategic depth. Their lines of communication run perilously close to Indian territory; Lahore is situated just 27 kilometers from the international border, and most of Pakistan's fixed strategic assets could be targeted within minutes of a directive to launch India's strike aircraft. As the gap in conventional military capabilities widens between India and Pakistan, Islamabad's concerns would grow accordingly. As a consequence, Pakistani doctrine apparently holds that a nuclear detonation on national territory carried out by either conventional or nuclear means would constitute grounds for a retaliatory nuclear strike.[58]

The response of Pakistan's military leaders to a disadvantageous order of battle appears to be quite similar to that chosen by other small nuclear powers. "If we have only one bomb left," said one officer, "it will be targeted on New Delhi. If we have two, it will be New Delhi and Bombay." Both Indian cities contain large Muslim populations. Holding them hostage, and exterminating them in response to grave threats to Pakistan's vital national interests, is not viewed as a theological issue by those responsible for Pakistan's nuclear deterrent.[59]

Religion can either moderate or inflame passions. In South Asia, religion has not been a moderating influence. Religious differences can also have a bearing on nuclear postures. For example, clerics affiliated with Pakistan's largest religious party who champion the Bomb cite passages from the Koran to justify the targeting of fellow Muslims residing in India's major cities. One passage reads,

> Against them make ready your strength to the utmost of your power, including steeds of war, to strike terror into (the hearts) of the enemies of Allah and your enemies and others besides, whom you may not know.

Another passage suggests that if Muslims live voluntarily in the land of a country waging war with Muslims, they too, are subject to the terrible punishments of war. There are also many passages in the Koran that enjoin

Muslims not to engage in violence, and certainly not in bloodshed on a scale associated with the use of nuclear weapons.[60] If, however, Pakistan's leaders believe that the country's vital national interests are threatened, they could well target India's major cities.

The bad news in this analysis is that even a modest strategic competition in southern Asia could generate interactive nuclear requirements in a region largely devoid of stabilization measures. Moreover, this region is susceptible to crises, and crises add to perceived nuclear needs. Prospective missile defense deployments add another wild card to this volatile mix. The good news in this analysis is that, while the strategic dynamic among China, India, and Pakistan is quite complex, these interactions are geared toward a modest competition rather than a strategic arms race. All three countries have separate as well as common reasons for dampening their nuclear pursuits. Military and targeting rationales for a nuclear arms buildup are not compelling. Domestic political, bureaucratic, and institutional factors pushing for more and better nuclear capabilities are pale shadows of those present in the U.S.—Soviet competition.

WASHINGTON'S CHOICES

If change occurs merely through the act of observation, what changes might one expect though the act of deploying U.S. missile defenses? The triangular nuclear arms competition in southern Asia is at a very modest stage, when requirements are small, but amenable to growth. Washington's decisions could accelerate or moderate cascade effects depending on the design and extent of its missile defense deployments. The architecture chosen for U.S. missile defense deployments will speak volumes to Beijing. Sea-based missile defenses would not, by themselves, signal a U.S. intent to negate China's deterrent, which would likely be situated far inland, beyond the reach of these interceptors. Sea-based missile defenses would therefore suggest U.S. readiness for regional contingencies and the protection of friends and allies. Interceptor missiles based on U.S. soil might or might not suggest an attempt by Washington to negate Beijing's nuclear deterrent, depending on the number of interceptors deployed, their presumed capability, and the size of Beijing's ocean-spanning missile forces. Beijing would be most concerned over space-based interceptors that would continually be "on station" overhead. Space-based missile interceptors have the potential to be far more capable than those on land and at sea. By adding up the elements of U.S. missile defense plans, Beijing will determine U.S. intentions and necessary responses.

The extent of the nuclear cascade in southern Asia will be the sum total of many complex interactions to which the United States is a party. The first integer of China's modernized, three-digit inventory of nuclear weapons—and the mix of tactical and strategic warheads—therefore depend heavily on Washington's choices. If Washington designs and sizes its missile defenses to challenge China's nuclear deterrent, Beijing would react by upping the size and capability of its nuclear forces directed against the U.S. homeland and

against U.S. bases in the region. Alternatively, the choice by Washington not to threaten Beijing's deterrent would help moderate nuclear cascade effects in southern Asia.

It is in the U.S. national security interest, as well as in the interest of America's Asian friends and allies, to deploy highly capable theater missile defenses around China's periphery. Beijing utilizes short- and medium-range ballistic missiles for coercive purposes, and these missiles have already become expected instruments of regional warfare. The forward deployment of missile defenses, particularly at sea, would signal U.S. resolve to come to the aid of threatened friends and allies. For these and other reasons, U.S. theater missile defenses would not be welcomed by China, but they are nonetheless essential.

Furthermore, it is in the U.S. national security interest, as well as in the interest of Japan, India, and Pakistan, to depress the size of China's nuclear capability, not to seek its negation. The pursuit of a negation strategy is not only dangerous, but also highly unlikely to succeed, since it would depend on Beijing's inability or unwillingness to maintain a nuclear deterrent against the United States. This quest will fail as long as Beijing has the will and the resources to add to its nuclear stockpile.

Washington already enjoys overwhelming superiority over China in strategic offensive forces. Beijing has no national security interest in moving beyond a minimum deterrent unless Washington raises this requirement. Overwhelming U.S. strategic superiority does not, by itself, generate cascade effects, as long as China could successfully hide a portion of its limited arsenal. The overlay of missile defenses atop overwhelming U.S. strategic superiority would force Beijing to adjust upward the requirements of that hidden nuclear arsenal. The extent of this adjustment—and with subsequent steps by India and Pakistan—would depend largely upon the design and extent of U.S. missile defense plans. The resulting cascade effects and Chinese countermoves would be detrimental to regional stability.

The United States could seek to minimize cascade effects by designing and sizing national missile defenses against maverick states such as North Korea, Iran, and Iraq, rather than against China. A defense against the possible acquisition or development of ocean-spanning missiles in maverick states would require a modest insurance policy of a few tens of interceptors on American soil. Limited U.S. national missile defenses would be backed up by U.S. power projection forces that constitute the primary line of defense against missile inventories in maverick states. It is, after all, far easier and more cost-effective to destroy threatening missiles on the ground with conventional weapons than to intercept an incoming warhead in its final seconds of reentry. American preemptive military capabilities against missile production capabilities, storage and test sites could be reinforced, in selective cases, by a forward-leaning U.S. declaratory policy warning maverick states against the acquisition, development, or flight-testing of certain missiles.

This approach requires great care, however, in part because questions would naturally arise as to why preemption is suitable for and against some

states, but not others. The norm to be reinforced is nonproliferation, not preemption.[61] In each case, calculations of risk would vary depending on an evaluation of the threat and the likelihood of successful military action. Such calculations, however, would be rare and they would be made with or without a more pointed U.S. declaratory policy regarding missile proliferation. When the state carrying out preemption is itself guilty of proliferation—or of weakening nonproliferation regimes—the overall result would be doubly unfortunate, reinforcing both preemption and proliferation.

The diplomatic challenges and potential military consequences of putting into place a forward-leaning U.S. declaratory policy on preemption would be considerable, requiring much consultation with friends and allies. Diplomatic fallout could be diminished if a more pointed U.S. declaratory policy were linked to more concerted American efforts to strengthen multilateral nonproliferation accords. A more pointed U.S. declaratory policy would still need to provide leeway for choice, rather than straightjacketing presidents, but not so much leeway as to vitiate the message. In many, but not all cases, inference might have greater utility than specificity. There could be times, however, when the deterrent value of a more pointed U.S. declaratory policy would be greater than, say, the deployment of an additional 100 missile defense interceptors on U.S. soil. This tradeoff might be worth making if, for example, the net effect would be to dampen cascade effects in Asia.

If diplomacy and other means fail to prevent North Korea, Iran, and Iraq from acquiring missiles able to reach U.S. soil, the number of such missiles is likely to be very low. Conversely, even if the United States succeeds in preventing the spread of missiles with ocean-spanning range, these maverick states would retain many shorter-range missiles that threaten their neighbors and U.S. power projection forces. In every troubling case, priority must be given to theater missile defenses, while great care is required to correlate national missile defenses against the modesty of prospective threats.

U.S. national missile defense plans have a long history of being cast against improbable threats, raising serious doubt of their intended purpose. The first U.S. missile defense plan in the administration of President Lyndon Baines Johnson was ostensibly cast against China, a country that would not acquire ocean-spanning missiles for another 14 years. The Kremlin dismissed this rationale, rightly figuring that U.S. missile defenses were directed against the Soviet Union. President Richard M. Nixon offered a different rationale for national missile defenses—to protect missile silos—with only modest alterations to his predecessor's architecture. The global protection system against "limited" attack proposed by President George H.W. Bush consisted of almost 2,000 interceptors. Presidents William J. Clinton and George W. Bush proposed quite different architectures for the same declared purpose—a limited defense against mavericks—again generating disbelief in foreign capitals. The Clinton administration asserted that limited defenses could be compatible with the ABM Treaty, while the Bush administration asserted that the treaty was hopelessly outdated, irrelevant, and too constricting, even for limited defenses.

If Washington cannot maintain a straight story on missile defenses from one administration to the next, foreign capitals might be forgiven their skepticism and disbelief of official statements. Foreign governments hoped against hope that the Bush administration's verbal assaults on the ABM Treaty would be a prelude to deal making, but were proven wrong. President Bush's decision to abrogate the ABM Treaty would appear to be an excessive remedy for the deployment of very limited missile defenses, which is likely to prompt democrats on Capitol Hill to erect new firebreaks to replace those in the Treaty. Judgments as to U.S. strategic objectives will eventually come to rest after much partisan wrangling. In the meantime, foreign governments will proceed with contingency plans.

If the architecture chosen for national missile defense in the United States entails hundreds of missile interceptors to counter rogue missile threats, New Delhi might charitably ascribe such plans to worst-case thinking. Beijing would think and act differently. If U.S. intelligence community projections are correct, and if Beijing deploys only 100 or fewer warheads atop its ocean-spanning missiles by the year 2015, Beijing would likely view a comparable or larger number of U.S. missile interceptors as a concerted effort to negate its nuclear deterrent and to induce stress fractures in the Chinese economy by forcing still-greater defense expenditures. Islamabad would support China and worry about missile defense deployments in India. The deployment of less than 100 interceptor missiles on U.S. soil as an insurance policy against mavericks would still prompt an undesired increase in China's strategic nuclear forces and trickle-down effects on the Subcontinent, but with diminished negative and unintended consequences. The thinner the deployment on U.S. soil the better the chances for limiting cascade effects in southern Asia.

U.S. space warfare programs would generate very little, if any, charitable explanation from foreign capitals. Instead, a U.S. push to weaponize space is likely to promote collaboration between Moscow and Beijing to counter U.S. strategic superiority and space operations at least cost. Responses would be asymmetric in nature, since Beijing and Moscow cannot match Washington's resources or technological advantages. U.S. advantages could nonetheless be neutered through countermeasures that are relatively inexpensive and that could create havoc with advanced, complex, and vulnerable sensors essential for the military and commercial utilization of space. It is easier for weaker adversaries to level the playing field in space than to counter U.S. terrestrial superiority.

The Challenges Ahead

The deployment or transfer of theater missile defenses by the United States could have positive as well as negative repercussions. In contrast, prospective U.S. deployments of national missile defenses overwhelmingly point to negative repercussions and downside risks, especially in Asia. Cascade effects in triangular interactions among China, India, and Pakistan have already begun in the form of contingency planning. Washington's decisions could dampen

or heighten negative effects. Safety ledges could still be found and slippery slopes avoided if U.S. national missile defenses are designed against maverick states rather than China, and if Washington refrains from weaponizing space. These dampening measures could be realized by executive-branch forbearance or by congressional control of the purse.

National leaders in India, China, and Pakistan need to find the wisdom to exercise restraint. They also need wise U.S. policy choices, because their own security dilemmas are so complicated. The triangular geometry of regional competition in southern Asia overlays two dyads. In each of the dyads, the stronger of the two antagonists does not outwardly acknowledge its competitor, making formalized nuclear risk reduction extremely difficult. A triangular effort to moderate cascade effects would be plagued by this history, and by the lack of symmetry resulting from three-cornered interactions. Even without the added complications of U.S. missile defenses, formalized bilateral or trilateral arrangements dampening nuclear interactions would be very difficult to negotiate. National or theater missile defense deployments further complicate this picture.

National leaders in China, India, and Pakistan have all declared their firm intention not to repeat the nuclear excesses of the United States and Soviet Union. The only clear benefit of nuclear excess during the Cold War was that large arsenals provided insurance against a surprise attack, making strategic defeats or preemption inconceivable. Despite repeated domestic scares, the U.S.–Soviet nuclear balance, as Bernard Brodie noted, was far from "delicate":

> For either superpower to attack the other because of an optimistic guess of the latter's vulnerabilities is obviously to take a risk of cataclysmic proportions. Neither can be seduced into such an error by some apparent shift in the relationship of forces—usually more apparent to technicians than to politicians. Nor will either superpower be seduced by the appearance of some new mechanical contrivance which at best affects only a part of the whole scheme of things, usually a small part.[62]

Small nuclear arsenals provide far less insurance against faulty calculations. Put another way, limited arsenals are more likely to generate risks than to guarantee risk reduction. Indeed, the historical record suggests that security concerns have been particularly worrisome to states possessing small nuclear arsenals. This was certainly true for the U.S.–Soviet experience, when nuclear risks were greatest in the early phases of arsenal building, when vulnerabilities were evident, verification weak, and command and control unsure. Thus, during the formative stages of their nuclear competition, the United States and the Soviet Union faced harrowing crises over Berlin and Cuba. The Korean War was fought under the shadow of the mushroom cloud. Likewise, soon after Beijing acquired a nuclear capability, it fought border skirmishes with Moscow. The brief, crisis-filled record since India and Pakistan acquired offsetting nuclear capabilities, including their high-altitude war in 1999, confirms this pattern.[63]

Nuclear risk reduction in southern Asia will be a far more complex undertaking than was the case for the United States and the Soviet Union, in part because the Cold War risk-reduction agenda was not further complicated by open-ended national missile defense deployments. As bad as Cold War nuclear dangers were, bipolarity provided a measure of simplification. The nuclear balance was codified in treaties predicated on equality. These treaties obligated the parties to accept intrusive monitoring. A common understanding of stabilizing and destabilizing activities was negotiated. Competition continued to be pervasive, and yet aspects that were most dangerous were placed off-limits. Berlin and Korea were divided, but Washington and Moscow did not exchange artillery fire across these lines. U.S. and Soviet military planning was not predicated on daily, violent interactions between their armed forces.

India, Pakistan, and China are very distant from these stabilizing conditions. In Central Europe, international boundaries were fixed; not so for India, Pakistan, and China. Even the relatively quiet LoC between India and China is the occasional scene of jockeying between military patrols. During the 1990s, ritualized violence in the form of small-arms fire and artillery exchanges was a regular occurrence along the LoC dividing Kashmir. The geometry of strategic competition in southern Asia makes triangular or bilateral treaty arrangements unlikely, since none of the three parties will accept formalized equality or inequality with another. Consequently, stand-alone nuclear risk-reduction arrangements become more essential, but also more difficult, given the absence of trust that verifiable treaty obligations might generate. Cooperative risk reduction in this region is intermittent unreliable, and of unequal interest to the parties.

If New Delhi, Beijing, and Islamabad are to find nuclear safety, they are likely to do so through a combination of bilateral cooperation, unilateral preparation to reduce the risk of accident or miscalculation, and unilateral restraint. In the absence of verifiable treaty regimes, nuclear risk reduction is likely to be found—if at all—through an acceptance of bilateral asymmetries in force sizing and deployment readiness. Pakistan, the state with the weakest military posture and most vulnerable nuclear deterrent, would have to refrain from competing with India, while maintaining some nuclear capabilities in a survivable status. New Delhi would need to refrain from competing with China and from posturing its nuclear capabilities so as to threaten Pakistan. Beijing sits atop this cascade. Consequently, the scope of the nuclear competition within southern Asia will be set primarily by China's decisions. The larger China's nuclear arsenal grows—whether in response to U.S. missile defense plans or for other reasons—the more likely it will generate cascade effects elsewhere in the region.

The establishment of hierarchical and stable nuclear postures in southern Asia is an enormously difficult and ambitious agenda. Successful nuclear risk reduction will require finding a unique mixture of transparency and survivability for nuclear capabilities, as well as creative monitoring arrangements that provide reassurance without increased vulnerability. This agenda has

barely begun at a time when it can be severely buffeted by prospective U.S. deployments of missile defenses. Perturbations in Asia are insufficient reasons for the United States to forego a modest insurance policy against the low probability of a ballistic missile attack on the U.S. homeland. Nonetheless, the complex triangular interactions between China, India, and Pakistan and the prospect of an Asian nuclear cascade mandate great care in the design and extent of U.S. national missile defenses.

NOTES

1. An earlier version of this essay was originally published in Michael Krepon, *The Impact of US Missile Defenses on Southern Asia* report no. 46 (Washington, DC: The Henry L. Stimson Center, July 2002), 61–96.
2. Glenn Snyder began to explore the instabilities associated with offsetting nuclear arsenals in *Deterrence and Defense*, (Princeton, NJ: Princeton University Press, 1961). Robert Jervis gave content to this dilemma in *The Illogic of American Nuclear Strategy* (Ithaca, NY: Cornell University Press, 1984). For its application to South Asia, see Michael Krepon and Chris Gagne eds., *The Stability–Instability Paradox: Nuclear Weapons and Brinksmanship in South Asia* report no. 38 (Washington, DC: The Henry L. Stimson Center, June 2001).
3. National Security Advisory Board of India, "The Draft Report of the National Security Advisory Board on Indian Nuclear Doctrine" (August 17, 1999), section 2.3, Internet: http://www.indianembassy.org/policy/CTBT/nuclear_doctrine_aug_17_1999.html.
4. "China's Military Views the World," *International Security* vol. 24, no. 3 (Winter 1999–2000): 55.
5. The Badar-II was launched from the Russian Cosmodrome at Baikonur, Kazakhstan on December 10, 2001. See "Satellite Badar-II launched," *Dawn* (Pakistan) (December 11, 2001), Internet: http://www.dawn.com/2001/12/11/top5.htm. For a description of Badar-II's projected capabilities see John Pike, "Pakistan and Earth Observation Systems," (November 28, 1999), Internet: http://www.fas.org/spp/guide/pakistan/earth/.
6. See Roger Dingman, "Atomic Diplomacy During the Korean War," *International Security* vol. 13, no. 3 (Winter 1988–1989); Jack Snyder, "Atomic Diplomacy in the Korean War," *Pew Case Studies in International Affairs* Case 359 (Cambridge, MA: Harvard University Press, 1993); and Gordon Chang, *Friends and Enemies: the United States, China, and the Soviet Union, 1948–1972* (Stanford, CA: Stanford University Press, 1990): 116–42.
7. "On the Ten Major Relationships," *Selected Works of Mao Tsetung* vol. 5 (Beijing: Foreign Language Press, 1977), 288.
8. "How China Develops its Nuclear Weapons," *Beijing Review* (April 29, 1985), 17.
9. US Department of Defense, Office of the Secretary of Defense, *Proliferation: Threat and Response* (Washington, DC: Department of Defense, January 2001), 14.
10. See Bates Gill and James Mulvenon, "The Chinese Strategic Rocket Forces: Transition to a Credible Deterrence," *China and Weapons of Mass Destruction: Implications for the United States*, Conference Report (November 5, 1999), 13. This paper, prepared for the National Intelligence Council, can be accessed at www.cia.gov/nic/pubs/conference_reports/weapons_mass_destruction.html.

11. China reportedly increased its defense spending by 17 percent in both 2001 and 2002. "China Plans Major Boost In Spending for Military," *Washington Post* (March 6, 2001) and "China Raises Defense Budget Again," *Washington Post* (March 5, 2002).
12. Alastair Iain Johnston, "China's New 'Old Thinking': The Concept of Limited Deterrence," *International Security* vol. 20, no. 3 (Winter 1995–1996): 5–6.
13. Author's interviews at the Ministry of External Affairs and Ministry of Defence, New Delhi (November 2000).
14. U.S. Department of Defense, *Proliferation: Threat and Response*, 14.
15. Ibid., 13. Also see National Intelligence Council, *Global Trends 2015: A Dialogue About the Future With Nongovernmental Experts* (Washington, DC: National Intelligence Council, December 2000), 55; and Stephen Lee Myers, "Intelligence Report Says U.S. Missile Defense May Stimulate China," *New York Times* (August 10, 2000).
16. National Intelligence Council, "Foreign Missile Developments and the Ballistic Missile Threat Through 2015" (Washington, DC: National Intelligence Council, December 2001), 10. This estimate can be accessed at www.cia.gov/nic/pubs/other_products/Unclassifiedballisticmissilefinal.htm.
17. See Philip C. Saunders and Jing-dong Yuan, "China's Strategic Force Modernization: Issues and Implications for the United States," in Michael Barletta, ed., *Proliferation Challenges and Nonproliferation Opportunities for New Administrations*, CNS Occasional Paper no. 4 (Monterey, CA: Center for Nonproliferation Studies, September 2000); David Shambaugh, "Facing Reality in China Policy," *Foreign Affairs* vol. 80, no. 1 (January–February 2001): 52; Robert Manning, Ronald Montaperto, and Brad Roberts, *China, Nuclear Weapons, and Arms Control: A Preliminary Assessment* (New York: Council on Foreign Relations, May 2000), 49–50. Brad Roberts enumerates a continuum of possible responses to NMD deployment in "China," in James J. Wirtz and Jeffrey A. Larsen, eds., *Rockets' Red Glare: Missile Defenses and the Future of World Politics* (Boulder, CO: Westview Press, 2001), 183–211.
18. This term has been widely borrowed from Itty Abraham, "India's 'Strategic Enclave:' Civilian Scientists and Military Technologies," *Armed Forces and Society* vol. 18, no. 2 (Winter 1992).
19. George Perkovich, *India's Nuclear Bomb, The Impact of Global Proliferation* (Berkeley, CA: University of California Press, 1999), 421. For a well-sourced Indian perspective, see Raj Chengappa, *Weapons of Peace* (New Delhi: Harper Collins, 2000).
20. For an assessment of the factors behind India's tests, see Michael Krepon, "Introduction," in *The Balance of Power in South Asia* (Abu Dhabi: The Emirates Center for Strategic Studies and Research, 2000), 1–10.
21. See, for example, Vajpayee's remarks before the Rajya Sabha on May 29, 1998 and his Independence Day Speech on August 15, 1998, which are accessible at www.indianembassy.org. Also see Foreign Minister Jaswant Singh's interview in the *Hindu* (India) (November 29, 1999).
22. For the text of the report and an informed analysis of it, see Arvind Kumar ed., *Report on a Workshop on The Draft Indian Nuclear Doctrine*, NIAS Report R1-2001 (Bangalore: National Institute of Advanced Studies, 2001).
23. Bharat Karnad, "A Thermonuclear Deterrent," in Amitabh Mattoo, ed., *India's Nuclear Deterrent: Pokhran II and Beyond* (New Delhi: Har-Anand, 1999), 109–49. An overview of non-official views can be found in Sumit Ganguly,

"Potential Indian Nuclear Force Postures," CMC Occasional Paper no. 19 (Albuquerque, NM: Cooperative Monitoring Center, Sandia National Laboratories, January 2001), from which this analysis is drawn.

24. Vijai K. Nair in Mattoo, ed., *India's Nuclear Deterrent*, 105.
25. "Nuclear Force Design and Minimum Deterrence Strategy for India," in Bharat Karnad ed., *Future Imperilled: India's Security in the 1990s and Beyond* (New Delhi: Viking Penguin, 1994), 177–95.
26. Jasjit Singh, *Nuclear India* (New Delhi: Knowledge World, 1998), 315.
27. Raja Menon, *A Nuclear Strategy for India* (New Delhi: Sage Publications, 2000), 225–28.
28. "Command and Control of Small Nuclear Arsenals," in Singh, ed., *Nuclear India*, 268.
29. In Mattoo ed., *India's Nuclear Deterrent*, 88.
30. Menon, *A Nuclear Strategy for India*, 169.
31. In Mattoo ed., 142. Karnad suggests Chinese military targets as "secondary" targets.
32. The clearest exception to this standard was the Indian Navy's shelling of oil facilities in Karachi in December 1971. However, acts of terror in urban areas presumably carried out with the support of intelligence agencies are not uncommon.
33. Ashley Tellis, "India's Emerging Nuclear Doctrine: Exemplifying the Lessons of the Nuclear Revolution," *NBR Analyses* vol. 12, no. 2 (Seattle: The National Bureau of Asian Research, May 2000): 8. For an elaboration of Tellis' analysis, see *India's Emerging Nuclear Posture: Between Recessed Deterrence and Ready Arsenal* (Santa Monica, CA: RAND, 2001).
34. Tellis, *India's Emerging Nuclear Posture*, 348.
35. Tellis, "India's Emerging Nuclear Doctrine," 102.
36. "How Robust is India–Pakistan Deterrence?" *Survival* vol. 42, no. 4 (Winter 2000–2001): 152.
37. See, for example, the remarks of Indian Army Chief General S. Padmanabhan in "From one General to another: we're ready," the *Indian Express* (January 12, 2002).
38. "Nuclear Risk Reduction," *Dawn* (Pakistan) (April 7, 2001).
39. "How Robust is India–Pakistan Deterrence?" 150.
40. See, for example, http://www.fas.org/nuke/guide/pakistan/facility/khushab.htm.
41. See Bill Gertz, "Pakistan builds missile sites," the *Washington Times* (January 14, 2002). Also see Kanti Bajpai, P.R. Chari, Pervaiz Iqbal Cheema, Stephen Cohen, and Sumit Ganguly, *Brasstacks and Beyond: Perception and Management of Crisis in South Asia* (Urbana, IL: University of Illinois, Urbana-Champaign, 1995); Stephen P. Cohen, P.R. Chari, Pervaiz Iqbal Cheema, *The Compound Crisis of 1990: Perceptions, Politics, and Insecurity*, ACDIS Research Report (Urbana, IL: University of Illinois, Urbana-Champaign, July 2000); and Chengappa, *Weapons of Peace*, 9, 327, 357. The extent to which Pakistan prepared to use its nuclear capability in the 1990 crisis has been wildly exaggerated by Seymour M. Hersh, "On the Nuclear Edge," the *New Yorker* (March 29, 1993), 56–73. Hersh's account was repeated in William E. Burrows and Robert Windrem, *Critical Mass, The Dangerous Race for Superweapons in a Fragmenting World* (New York: Simon & Schuster, 1994). For a participants' account of the 1990 crisis, see Michael Krepon and Mishi Faruqee, eds., *Conflict Prevention and Confidence-Building Measures in South Asia: The 1990 Crisis*, Occasional Paper no. 17 (Washington, DC: The Henry L. Stimson Center, April 1994).

42. Xue Litai, "Evolution of China's Nuclear Strategy," in John C. Hopkins and Weixing Hu, eds., *Strategic Views from the Second Tier: The Nuclear Weapons Policies of France, Britain, and China* (New Brunswick: Transaction Publishers, 1995), 167–89; You Ji, *The Armed Forces of China* (New York: I.B. Tauris, 1999), 88; and Menon, *A Nuclear Strategy for India*, 223. A drawing of Soviet submarine tunnel basing can be found in U.S. Department of Defense, *Soviet Military Power* (Washington, DC: Department of Defense, March 1986), 20–21.
43. This sad tale in best told in Ahmed Rashid, *Taliban: Militant Islam, Oil and Fundamentalism in Central Asia* (New Haven: Yale University Press, 2000).
44. See Musharraf's interview with Arnaud de Borchegrave, "Bin Laden 'cult figure' of Pakistani Muslims," *Washington Times* (March 21, 2001).
45. "Security Dilemmas of Nuclear-Armed Pakistan," *Third World Quarterly* no. 21 (October 2000), 782, 790.
46. See P.K. Iyengar, the *Times of India* (February 10, 2000); "Corrupt Nuclear Yields," *Jane's Intelligence Review* (December 1, 1998), 20; and "Size of Indian Blasts Still Disputed," *Science* vol. 281, no. 5385 (September 25, 1998): 1939.
47. See Alastair Iain Johnston, "China's New 'Old Thinking': The Concept of Limited Deterrence," *International Security* vol. 20, no. 3 (Winter 1995–1996): 5–42.
48. Robert S. Norris and William M. Arkin, "NRDC Nuclear Notebook: Chinese Nuclear Forces," *Bulletin of the Atomic Scientists* vol. 56, no. 6 (November–December 2000): 78–79.
49. Mark A. Stokes, *China's Strategic Modernization: Implications for the United States* (Carlisle, PA: Strategic Studies Institute, U.S. Army War College, September 1999), 117–23 and Steven Lambakis, *On the Edge of Earth: The Future of American Space Power* (Lexington: The University Press of Kentucky, 2001), 147–50.
50. See chapters by Michael Quinlan and David S. Yost in John C. Hopkins and Weixing Hu eds., *Strategic Views from the Second Tier: The Nuclear Weapons Policies of France, Britain, and China* (New Brunswick: Transaction Publishers, 1995).
51. Interview of Sha Zukang by Michael R. Gordon, "China Fearing a Bolder U.S., Takes Aim on Proposed National Missile Shield," *New York Times* (April 29, 2001), 6.
52. See Rajesh M. Basrur, "Nuclear Weapons and Indian Strategic Culture," *Journal of Peace Research* vol. 38, no. 2 (March 2001): 181–98.
53. Interview with C. Raja Mohan in the *Hindu* (India) (November 29, 1999).
54. See R. Jeffrey Smith, "India Moves Missiles Near Pakistan Border," *Washington Post* (June 12, 1997); Perkovich, *India's Nuclear Bomb*, 396; Menon, *A Nuclear Strategy for India*, 202; and Pravin K. Sawney, "Pakistan Scores Over India In Ballistic Missile Race," *Jane's Intelligence Review* (November 1, 2000).
55. "India's Missiles In Position: Fernandes," the *Times of India* (December 26, 2001), Internet: http://www.timesofindia.com/articleshow.asp?catkey=843527949&art_id=1778730327&sType=1.
56. For a sense of the collateral damage that could be produced from various targeting options, see the Natural Resources Defense Council, *The U.S. Nuclear War Plan: A Time for Change* (Washington, DC: Natural Resources Defense Council, June 2001), Internet: www.nrdc.org.
57. One such effort was Herman Kahn's *Thinking About the Unthinkable* (New York: Horizon Press, 1962). Another was Kahn's *On Escalation: Metaphors and Scenarios* (New York: Frederick A. Praeger, 1965).

58. Confidential interviews by the author, 2001.
59. Confidential interviews by the author, 2001.
60. The first passage of the Koran, Sura Anfal, also contains verses that dictate against unnecessary bloodshed and the protection of noncombatants. Sura Al-An'am states, "... take not life which Allah has made sacred, except by way of justice and law." The second passage referenced is Sura 4, verse 97. (Email communications from Khalid Rahman, Institute of Policy Studies, Islamabad, August 8, 2001, and Sameer Ahmad, Stanford University, August 29, 2001.)
61. See Jessica Mathews, "Not Saddam But His Weapons," *International Herald Tribune* (March 5, 2002).
62. "On the Objectives of Arms Control," *International Security* vol. 1, no. 1 (Summer 1976): 32–33.
63. For a comparative assessment of nuclear risks, see Michael Krepon, "Nuclear Risk Reduction: Is Cold War Experience Applicable to South Asia?" in Michael Krepon and Chris Gagne eds., *The Stability–Instability Paradox: Nuclear Weapons and Brinksmanship in South Asia* report no. 38 (Washington, DC: The Henry L. Stimson Center, June 2001).

Contributing Authors

Mutahir Ahmed is Assistant Professor in the Department of International Relations at the University of Karachi, where his research focuses on conflict resolution, confidence-building measures, arms control and disarmament, and religious extremism. He is coordinator of the Program on Peace Studies and Conflict Resolution at the Department of International Relations, and was a Visiting Fellow at the Stimson Center in 2001. He has authored and edited work in *Annual Journal of the Center for Regional and Trans-Border Studies* (2001); *National Development and Security* (1999); *Pakistan Perspective; Contemporary South Asia* (1997); *Journal of European Studies* (1997); *Eurasian Studies* (1995); and *Pakistan Horizon* (1992).

Rajesh M. Basrur received his M.A. and M.Phil. in History from the University of Delhi, and an M.A. and Ph.D. in Political Science from the University of Mumbai. He taught History and Politics in Mumbai from 1978 to 2000, and is now Director of the Center for Global Studies in Mumbai, India. He has been a Shastri Fellow at Simon Fraser University in Canada (1994), a Fulbright Fellow at the University of Illinois at Urbana-Champaign (1995–1996), and a Visiting Fellow at the Henry L. Stimson Center (2001), the Brookings Institution (2001–2002) and the Sandia National Laboratories (2002). He is the author of *India's External Relations: A Theoretical Analysis* (2000); and has edited *Security in the New Millennium: Views from South Asia* (2001); and *Perspectives on India's Defense and Arms Control* (1999).

Kent Biringer is a Distinguished Member of the Technical Staff at Sandia National Laboratories and serves as Deputy Program Manager and South Asia Project Manager at the Cooperative Monitoring Center. The Center works with U.S. and foreign participants to explore ways that technology can facilitate regional confidence building in such areas as arms control, nonproliferation, and environmental security. He has worked at Sandia for 26 years in solar, electric, and fossil energy research, systems analysis, manned space exploration, arms control, nonproliferation and cooperative monitoring. He received a B.S. and an M.M.E. in mechanical engineering from Rice University. He is a Fellow in the American Society of Mechanical Engineers, has authored over 30 papers, and is a registered professional engineer in New Mexico.

P.R. Chari is Director of the Institute of Peace and Conflict Studies. He is a former member of the Indian Administrative Service. He served in senior positions at the Central and State level before retiring from government service in 1992. He served two tours (1971–1975, 1985–1988) in the Ministry of Defense. His last position there was Additional Secretary. He served as Director of the Institute for Defense Studies and Analyses from 1975–1980, and was an International Fellow at the Center for International Affairs, Harvard University (1983–1984), and Research Professor at the Center for Policy Research (1992–1996). He is the author, editor, or co-editor of *India-Pakistan Nuclear Stand off: Role of the United States* (1995); *Brasstacks and Beyond: Perception and Management Crisis* (1995); *Nuclear Non-Proliferation in*

India and Pakistan: South Asian Perspectives (1996); *India: Towards Millennium* (1998); *Perspectives on National Security in South Asia: In Search of a New Paradigm* (1999); *Kargil: The Tables Turned* (2001); *The Simla Agreement, 1972* (2001); *Security and Governance in South Asia* (2001); *Working towards a Verification Protocol for Biological Weapons* (2001).

Brian Cloughley served in the British and Australian armies and saw combat in Borneo. He served in the Middle East, was Survey Officer in a nuclear missile regiment in Germany, and commanded the Australian Psychological Operations Unit in Vietnam. He was deputy head of the U.N. mission in Kashmir (1980–1982), Staff Officer 1 (Force Structure) in Australia (when he was appointed to the Order of Australia), and defense attaché in Islamabad (1989–1994). In 1996–1997 he was consultant to the Organization for Economic Co-operation and Development on the relationship between defense expenditure and aid in South Asia. In November 2001 he gave the annual Dr. L.M. Singhvi Lecture in Pluralism at the University of Leicester. He is the author of *A History of the Pakistan Army* (2000). His work has also appeared in SMi Group publications and the journal *Security Dialogue*.

Chris Gagné is a student at Boston College Law School and former Research Associate with the Regional Security in South Asia Project at the Stimson Center (1999–2002). He graduated from Dickinson College in 1998 with a B.A. in Anthropology and Policy Studies, and a concentration in International Policy. He has studied in southern India and returned to the region after graduation as assistant to the director of the South India Term Abroad Program. He is the recipient of a Herbert Scoville, Jr. fellowship.

John Hawes is a retired United States Foreign Service Officer. He was the United States negotiator for the 1992 Open Skies Treaty that covered the members of NATO, the European neutral states, and the members of the former Warsaw Pact. During his 30 year career in the U.S. Foreign Service, he served in a variety of positions in Europe, Africa, and Asia, including India. He focused primarily on political-military issues, including the NATO Alliance and questions of arms control, confidence building, and disarmament.

Rafi uz Zaman Khan is Deputy Director of Arms Control and Disarmament at the Strategic Plans Division at Joint Staff Headquarters in Rawalpindi, Pakistan. He has a B.A. from the University of Peshawar and an MSc. in Defense and Strategic Studies from Quaid-e-Azam University. He is also a graduate of the Canadian Forces Command and Staff College in Toronto. He was a Visiting Fellow at the Stimson Center (2002).

Michael Krepon is the Founding President of the Henry L. Stimson Center, which he ran from 1989 to 2000. He is the author, editor, or co-editor of *Strategic Stalemate, Nuclear Weapons and Arms Control in American Politics* (1984); *Arms Control in the Reagan Administration* (1989); *Verification and Compliance, A Problem-Solving Approach* (1988); *Commercial Observation Satellites and International Security* (1990); *The Politics of Arms Control Treaty Ratification* (1991); *Open Skies, Arms Control and Cooperative Security* (1992); *Crisis Prevention, Confidence Building, and Reconciliation in South Asia* (1995); *Global Confidence-Building: New Tools for Troubled Regions* (1999); and *Cooperative Threat Reduction, Missile Defense, and the Nuclear Future* (2002).

Arvind Kumar is a Research Associate at the National Institute of Advanced Studies in Bangalore. He received his M.A. in International Politics and his M.Phil. in

American and West European Studies from Jawaharlal Nehru University in New Delhi. He is currently working on his Ph.D. thesis entitled "Redesigning Defense: U.S. National Security Strategies and Interests in the 1980s." He has taught graduate-level classes in Political Science, Comparative Politics, Political Theory, and International Politics at the University of Delhi. He previously worked as a Research Analyst at the Institute for Defense Studies and Analyses, was a Visiting Fellow at the Stimson Center (2000) and a Visiting Scholar at the Cooperative Monitoring Center of Sandia National Laboratories (2002).

Ellen Laipson joined the Henry L. Stimson Center as president and chief executive officer in April 2002, after nearly 25 years of government service. Her previous positions in various foreign policy and national security institutions include: vice chairman of the National Intelligence Council (1997–2002); Special Assistant to the U.S. Permanent Representative to the United Nations (1995–1997); Director for Near East and South Asian Affairs, National Security Council (1993–1995); National Intelligence Officer for Near East and South Asia (1990–1993); and Member, Policy Planning Staff, Department of State (1986–1987). Her work has appeared in *Foreign Affairs* and *The Washington Quarterly*. She received an A.B. from Cornell University and an M.A. from Johns Hopkins School of Advanced International Studies.

Lawrence S. Prabhakar is Associate Professor of Political Science at Madras Christian College, Chennai. He is Honorary Secretary of the Center for Security Analysis, an independent policy research think tank based in Chennai. He graduated with M.A. and M.Phil degrees in Political Science from the Madras Christian College. He is on the Visiting Faculty of the Defense Services Staff College and the College of Naval Warfare. He was a Visiting Fellow at the Henry Stimson Center in 2001. His work was been published in *Asian Studies; Africa Quarterly; Tri-Service Professional Journal of the Defense Services Staff College; Mediterranean Politics; The Hindu; Indian Express; and Deccan Herald.*

Teresita C. Schaffer, Director of the South Asia Program at the Center for Strategic and International Studies, served for 30 years in the U.S. Foreign Service, and was one of the State Department's foremost South Asia experts. Her diplomatic posts included Tel Aviv, Islamabad, New Delhi, Dhaka, and Colombo, where she served as U.S. ambassador from 1992–1995. She was Deputy Assistant Secretary of State for South Asia from 1989–1992. She is the author of *Rising India and US Policy Options in Asia* (2002). Her writing has also appeared in *Creating Peace in Sri Lanka, The Washington Quarterly*, and numerous other publications.

W.P.S. Sidhu is Senior Associate at the International Peace Academy, New York. He was MacArthur Fellow at the Center for International Studies, Oxford University (1999–2000), Warren Weaver Fellow for International Security at the Rockefeller Foundation (1997–1998) and Research Associate at the London based International Institute for Strategic Studies (1996–1997). He has written extensively on South Asian security issues in general and on confidence building measures in particular, including an Adelphi Paper on *Enhancing Indo-US Strategic Cooperation*, and his work has appeared in *Asian Survey; The Bulletin of Atomic Scientists; International Peacekeeping; Politique Étrangère; Jane's Intelligence Review; Survival; Indian Express; India Today*; and the *Hindu*. He was awarded his Ph.D. from Cambridge University for his thesis "The Development of India's Nuclear Doctrine Since 1980" and is presently editing a book on the impact of South Asia's nuclear tests on other regions of concerns.

This page intentionally left blank

Index