— 6 —

Are Tactical Nuclear Weapons Needed in South Asia?

*Michael Krepon, Ziad Haider, and Charles Thornton**

Since India and Pakistan tested nuclear weapons in 1998, their leaders have rhetorically rejected the concept and requirements of nuclear war-fighting. Even during periods of deep crisis, such as following the December 2001 attack on the Indian parliament that led to a ten-month long military standoff, then-Chief of the Indian Army Staff General S. Padmanabhan declared, "Nuclear weapons are not meant for war-fighting. It's very foolish for us to even think of nuclear weapons in war-fighting."[1] Pakistani leaders have also made similar statements, such as President Pervez Musharraf's remarks in June 2002 that a nuclear conflict was unthinkable and that no "sane individual" would let it occur.[2]

At the same time, officials from both countries – including General Padmanabhan and President Musharraf – have also made thinly veiled nuclear threats. During the 2001-2002 crisis, for example, General Padmanabhan stated that India would severely punish any state that is "mad enough to use nuclear weapons against any of our assets." He added, "The perpetrator shall be so severely punished that his very existence will be in doubt. We are ready for a second strike."[3] Similarly, at the end of the standoff, President Musharraf declared that, "We have defeated an enemy without fighting a war." He went on to claim that if the Indian troops "took even a step across the international border or LoC (Line of Control), we will not only be in front of them, we will surround them. It will not remain a conventional war."[4]

Mixed nuclear messages are part of the subcontinent's vernacular, as leaders seek to bolster deterrence and play to domestic audiences, while at the

* The authors wish to thank Timothy Hoyt, Rodney W. Jones, Alistair Millar, and Michael Wheeler for their helpful comments.

[1] "India is 'Ready for War,'" *Guardian*, January 11, 2002, http://www.guardian.co.uk/kashmir/Story/0,2763,631343,00.html.

[2] "Pakistan President Calls Nuclear War Unthinkable," *USA Today*, June 2, 2002, http://www.usatoday.com/news/world/2002/06/01/pakistan.htm.

[3] Praful Bidwai, "India Sharpens Nuclear Claws," *Asia Times*, January 31, 2002, http://www.atimes.com/ind-pak/DA31Df03.html.

[4] "Warning forced India to pull back troops, says President," *Dawn*, December 31, 2002. This statement was subsequently "clarified" by Pakistan's military spokesman as meaning "unconventional forces and not nuclear or biological weapons." ("Gen shoots mouth off, backfires," *The Indian Express*, December 31, 2002)

same time reassuring distant audiences that they are responsible nuclear stewards.[5] During crises, harsh messages directed across the border are not uncommon. When crises have abated, reassuring messages that New Delhi and Islamabad reject nuclear war-fighting and the fine-tuning of nuclear arsenals are often heard. One reassuring message from both New Delhi and Islamabad is their intention to follow a doctrine of credible, minimum deterrence.[6] It remains unclear whether "tactical," "battlefield," or "short-range" nuclear weapon delivery vehicles are needed for credible, minimal deterrence, or whether these weapons fall under the category of instruments of nuclear war-fighting that can be dispensed with.

Authoritative statements by government officials in India and Pakistan regarding such weapons have been infrequent, with both sides relying heavily on calculated ambiguity. For example, in an interview with *The Hindu*, former Foreign Minister Jaswant Singh described the Indian position on tactical nuclear weapons as follows:

> Regarding tactical nuclear weapons, let me remind you that we do not see nuclear weapons as weapons of war-fighting. In fact, India sees them only as strategic weapons, whose role is to deter their use by an adversary. Civilian command and control over decisions relating to deployment and alert levels are logical.[7]

While the perceived lack of differentiation between tactical and strategic nuclear weapons is important, this formulation does not explicitly rule out the acquisition by India of short-range nuclear weapon systems or warheads designed for battlefield use that could reasonably be characterized as tactical nuclear weapons.

On the Pakistani side, the authors have searched in vain for explicit, authoritative public statements referring to "tactical" nuclear weapons. The most direct available reference in this regard can be found in an interview by two Italian researchers with the Director-General of the Strategic Plans Division at Joint Staff Headquarters. In this interview, Pakistani Lieutenant General Khalid Kidwai is represented as saying "explicitly that nuclear artillery is not part, *at the moment*, of the Pakistani nuclear programs."[8] This phraseology, like that of Jaswant Singh, leaves this option open.

---

[5] See Rahul Roy-Chaudhury's companion essay, "Nuclear Doctrine, Declaratory Policy, and Escalation Control" in this book.
[6] Press Information Bureau, Government of India, "Cabinet Committee on Security Reviews Progress in Operationalizing India's Nuclear Doctrine," January 4, 2003, http://pib.nic.in/archieve/lreleng/lyr2003/rjan2003/04012003/r040120033.html; Rory McCarthy, "Kashmir Has Not Gone Away," *Guardian*, March 7, 2003, http://www.guardian.co.uk/kashmir/Story/0,2763,909539,00.html.
[7] "India Not to Engage in N-Arms Race: Jaswant," *The Hindu*, November 29, 1999.
[8] Italics added for emphasis. For the entire interview summary, see http://www.pugwash.org/september11/pakistan-nuclear.htm.

While New Delhi and Islamabad appear quite confident that they will not repeat the Cold War and contemporary mistakes of Washington and Moscow in relying on nuclear war-fighting options to bolster deterrence, it is far from clear that the South Asian nuclear rivals would be willing to take steps to agree to constraints or to forego entirely short-range, battlefield or tactical nuclear weapons. Declaratory statements to this effect would not be verifiable, but they would reinforce public statements in favor of credible minimal deterrence and against nuclear war-fighting concepts of deterrence. The absence of new production and flight-testing of short-range, nuclear-capable ballistic missiles would lend credence to public disavowals of intent to pursue nuclear war-fighting capabilities**.** This, in turn, would reflect a keen appreciation by senior Indian and Pakistani leaders of the dangers and dilemmas associated with nuclear weapons of limited range, particularly with respect to command and control, physical security of forward deployed assets, and escalation control.

Complications in Restraint Regimes for Tactical Nuclear Weapons

Restraint regimes for tactical or battlefield nuclear weapons are very difficult to construct. One complicating factor is reaching a common definition of what is meant by battlefield or tactical nuclear weapons. It is by no means clear at this point how Indian and Pakistani officials define such weapons, and whether they could agree to a common definition. The United States and the Soviet Union agreed on a range-based definition for strategic nuclear delivery vehicles in the first (1972) and second (1979) Strategic Arms Limitation accords, as well as in the START I Treaty (1991). Common definitions of ground-launched ballistic and cruise missiles of lesser ranges were agreed upon in the 1987 Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Elimination of Their Intermediate-Range and Shorter-Range Missiles (INF Treaty).

In contrast, Washington and Moscow have not been willing or able to tackle negotiated constraints on tactical or battlefield nuclear weapons. Only at the very end of the Cold War did Presidents George H.W. Bush and Mikhail Gorbachev agree to unilateral, parallel, and unverifiable presidential initiatives to remove the least safe and secure tactical nuclear weapons from forward bases and from deployed forces. These "presidential nuclear initiatives" did not define the types of nuclear weapons subject to either's initiative, nor were verification provisions worked out. Until the Soviet Union was under severe strain, there was no great compulsion to address the dilemmas associated with tactical nuclear weapons. At no time during the Cold War did Washington and Moscow seek to clarify definitions of "tactical," "battlefield," "sub-strategic" and "non-strategic" nuclear weapons.[9]

[9] See Gunnar O. Arbman and Charles L. Thornton, *Russia's Tactical Nuclear Weapons – Part I: Background and Policy Issues*, Defense Research Agency (Totalförsvarets Forskningsinstitut, FOI), Swedish Ministry of Defense, Report # FOI-R--1057--SE, ISSN 1650-1942, November 2003. The

During the Cold War, nuclear strategists employed varied definitions of tactical nuclear weapons. These weapons were sometimes defined in relation to their intended use and zone of employment; their yield, range, or designated target; the type of delivery vehicle; or the level of command associated with the weapon in question. A particular weapon might be considered tactical by the United States and strategic by the Soviet Union, or *vice versa*, depending on its location, range, and intended target. Some writers during the Cold War described tactical nuclear weapons as low-yield weapons that were not meant to cause widespread physical destruction. Instead, they were to be used discriminately against a variety of military targets on the battlefield, including enemy tanks and mechanized infantry, while generating as little collateral damage as possible.[10] Range was clearly an important, although not necessarily a determinative factor, for categorizing tactical nuclear weapons. [11]

Fifteen years after the Cold War ended, US, Russian, and NATO officials finally sat down to clarify definitions of tactical nuclear weapons. Table 1 reproduces the definitions in the *NATO/Russia Glossary of Nuclear Terms and Definitions*.[12]

A second complicating factor is geography. Based on the range criterion of defining tactical nuclear weapons, some would argue that a nuclear-armed delivery system with a range of 150 kilometers or less could well be considered a tactical nuclear weapon.[13] By this standard, India and Pakistan either possess tactical nuclear weapons or nuclear-capable weapon systems in the form of the *Prithvi I* and *Hatf I* missiles. Possessing such weapon systems, however, does not necessarily foreclose formal or tacit agreements to maintain them in storage or far away from the forward edge of the battlefield, or clarify that these short-range missiles are not mated with nuclear warheads and do not have nuclear roles. If the governments of Pakistan and India were serious about clarifying their intent not to adopt nuclear war-fighting postures, they could tacitly or formally agree to any or all of these measures, as will be discussed below.

---

full report is available at http://www.cissm.umd.edu/thornton.htm. See also James A. Baker, III with Thomas M. DeFrank, *The Politics of Diplomacy* (New York: G.P. Putnam's Sons, 1995), pp. 82-83, 526, 575, and 596-597.

[10] John P. Rose, *The Evolution of US Army Nuclear Doctrine, 1945-1980* (Boulder, CO: Westview Press, 1980), p. 45.

[11] See Andrea Gabbitas, "Non-Strategic Nuclear Weapons: Problems of Definition" in Jeffrey A. Larsen and Kurt J. Klingenberger, eds., *Controlling Non-Strategic Nuclear Weapons: Obstacles, and Opportunities* (USAF Academy, CO: Institute for National Security Studies, June 2001). One researcher, O. Sukovic, wrote, "The main difference lies in the distance they are able to travel. The range of the TNW is not sufficient to cause any serious damage to the Russian mainland." "Tactical Nuclear Weapons in Europe," in *Tactical Nuclear Weapons: European Perspectives*, SIPRI (London: Taylor & Francis, 1978), p. 138.

[12] Available at http://www.nato.int/docu/glossary/eng-nuclear/index.htm.

[13] Feroz Khan advances this proposition in his companion essay, "Nuclear Signaling, Missiles, and Escalation Control in South Asia."

TABLE 1: US AND RUSSIAN DEFINITIONS

Russian Federation	United States
Non-strategic nuclear weapons Non-strategic nuclear weapons include all nuclear weapons which do not fall into the class of strategic nuclear weapons, that is, weapons with less than 5000 km ranges, to include Tactical and Operational nuclear weapons. *Tactical nuclear weapons* Tactical nuclear weapons are designed to engage objects in the tactical depth of enemy deployment (up to 300 km) to accomplish a tactical mission. Under certain conditions, tactical nuclear weapons may be involved in operational and strategic missions. *Operational nuclear weapons* Operational nuclear weapons are designed to engage objects in the operational depth of the enemy deployment (up to 500 km) with the purpose of accomplishing an operational mission. Under certain conditions operational nuclear weapons may be involved in the accomplishment of strategic missions and in exceptional cases, in the accomplishment of tactical missions.	*Non-strategic nuclear forces* Those nuclear-capable forces located in an operational area with a capability to employ nuclear weapons by land, sea, or air forces against opposing forces, supporting installations, or facilities. Such forces may be employed, when authorized by competent authority, to support operations that contribute to the accomplishment of the commander's mission within the theatre of operations. *Theatre nuclear forces* Nuclear forces designed for localized military missions.

Source: NATO/Russia Glossary of Nuclear Terms and Definitions, http://www.nato.int/docu/glossary/eng-nuclear/index.htm

At present, national leaders in India and Pakistan have declined to adopt any of these measures. It is clear from their public statements and actions that longer-range missiles and aircraft-delivered nuclear weapons are deemed essential for deterrence and for stability.[14] This essay argues that short-range, battlefield, or tactical nuclear weapons are dangerous for stability and unhelpful for deterrence. We argue that the benefits of a restraint regime relating to these weapons outweigh the benefits of calculated ambiguity.

First, we shall summarize Cold War experience. We will then highlight the differences between the Cold War experience and conditions on the

[14] Joint statement released on June 20, 2004 following the expert level meeting on nuclear confidence building measures, declared that "the nuclear capabilities of each other, which are based on their national security imperatives, constitute a factor of stability [in India-Pakistan relations]." "Joint Statement, Meeting Between Foreign Secretaries of India and Pakistan," June 28, 2004, http://meaindia.nic.in/jshome.htm.

subcontinent, while noting that many of the generic concerns associated with tactical nuclear weapons during the Cold War apply to South Asia, as well. Finally, we suggest several steps that might be considered by national leaders in Islamabad and New Delhi to clarify responsible nuclear stewardship and to set a very different example than Washington and Moscow.

COLD WAR THINKING ABOUT TACTICAL NUCLEAR WEAPONS

The authors have searched in vain for a coherent rationale and doctrine for the use of tactical nuclear weapons. The primary impetus behind US reliance on tactical nuclear weapons, beginning in the early 1950s, was to offset Soviet conventional military advantages in distant theaters.[15] Another rationale for the build-up of tactical nuclear weapons was to save money. As the Army was downsized during the Eisenhower administration, tactical nuclear weapons were viewed as a substitute for manpower and as a "logical culmination of the longstanding historical trend toward fielding more efficient sources of firepower."[16] Still other contributing factors were the reluctance of NATO allies to increase their troop strength, lobbying by nuclear weapon laboratories and the Atomic Energy Commission, and the desire of all services to have their own nuclear weapons available for battlefield use.

The Army's first field manual on tactical nuclear weapons, FM 100-31, published in 1951, stressed that atomic weapons should be integrated with other weapons when used tactically. Decisive results were to be obtained when "numerous atomic missiles are employed in a short period of time on selected targets over a wide area," and "where feasible, all tactical employment of atomic missiles is exploited by offensive maneuver." Atomic weapons were to be used against enemy troop concentrations, command and control nodes, and logistical support facilities.[17] The United States continued to modernize and expand its arsenal of tactical nuclear weapons through the early 1960s and 1970s, partly in response to Soviet deployment of such weapons, new doctrinal refinements, and technological advances produced by weapon laboratories. The US inventory of tactical nuclear weapons reached its peak in 1964 with approximately 23,000 non-strategic warheads, as depicted in Graph 1. The efficacy of NATO doctrine, which called for the use of these warheads in response to a Soviet conventional attack, was always questionable, especially after the Soviet Union acquired the ability to strike the continental United States with ocean-spanning missiles.

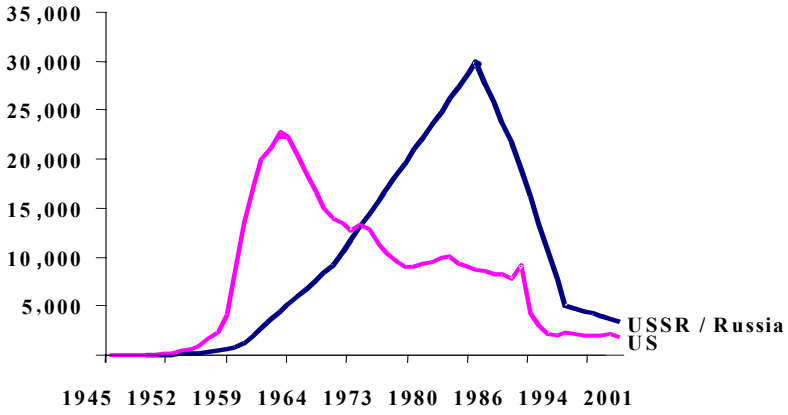
---

[15] See Milton Leitenberg, "Background Materials in Tactical Nuclear Weapons," in *Tactical Nuclear Weapons: European Perspectives*, SIPRI (London: Taylor & Francis, 1978); A.J. Bacevich, *The Pentomic Era: The US Army Between Korea and Vietnam* (Washington DC: National Defense University Press, 1986); and John P. Rose, *The Evolution of US Army Nuclear Doctrine, 1945-1980* (Boulder, CO: Westview Press, 1980).

[16] A.J. Bacevich, *The Pentomic Era: The US Army Between Korea and Vietnam* (Washington DC: National Defense University Press, 1986), p. 64.

[17] Rose, *The Evolution of US Army Nuclear Doctrine*, p. 85.

GRAPH 1: US AND USSR NON-STRATEGIC WARHEADS (1945-2002)



Source: "Archive of Nuclear Data," Natural Resources Defense Council, http://www.nrdc.org/nuclear/nudb/datainx.asp.

The Soviet Union amassed a huge stockpile of tactical nuclear weapons, notwithstanding the favorable conventional force imbalance it enjoyed in Central Europe. Soviet war-fighting plans, revealed after the Cold War ended, placed reliance on tactical nuclear weapons as war-fighting instruments to aid in a military offensive across Western Europe.[18]

Soviet military strategy against the west postulated the prompt escalation of a conventional conflict to the nuclear level, notwithstanding the Kremlin's public endorsement of a "no first use" nuclear posture. Instead, Soviet forces planned for massive nuclear strikes in conjunction with large-scale ground operations. Theater nuclear strikes were designed to destroy NATO's nuclear capabilities; defeat NATO ground combat forces; breach NATO defensive positions; and halt counterattacks. Nuclear strikes were intended to facilitate ground occupation of the European continent. Precisely how this would have occurred, in light of the devastation that would have been wreaked as a result of many nuclear detonations, is unclear.

---

[18] See Joseph D. Douglass, Jr., *The Soviet Theater Nuclear Offensive*, Studies in Communist Affairs 1, Prepared for the Office of Director of Defense Research and Engineering (Net Technical Assessment) and the Defense Nuclear Agency, Washington, DC, (1976); Also see *Warsaw Pact Military Planning in Central Europe: Revelations From the East German Archives*, [documents seized by Federal Republic of Germany from East German National People's Army following reunification], Translated and Annotated by Mark Kramer, Woodrow Wilson Center's Cold War International History Project, available at http://wwics.si.edu/index.cfm?fuseaction=library.document&topic_id=1409&id=6.

Estimates of the number of tactical nuclear weapons produced and deployed by Moscow, or moved into storage in the 1990s, reflect many uncertainties. Analysts at the Natural Resources Defense Council estimate that the Soviet arsenal reached its peak in 1986 at approximately 30,000 non-strategic warheads.[19] In 1987, NATO estimated that the Warsaw Pact had deployed 1,360-1,365 short-range nuclear-tipped missiles in Eastern Europe.[20] The Soviet inventory of tactical nuclear weapons consisted of short-range missiles, artillery-fired atomic projectiles, atomic demolition munitions, nuclear-equipped air defense missiles, and aircraft-delivered and sea-based weapons. There is no evident correlation between improvements in Soviet conventional capabilities and reduced reliance on tactical nuclear weapons in war planning. Instead, the public record suggests that Soviet military planners viewed tactical nuclear weapons and conventional strike capabilities as integrated parts of offensive operations. [21]

The United States and Soviet Union deployed tactical nuclear weapons for use by ground, air and naval forces. Some of these weapons, such as nuclear artillery, could be used at very short ranges of just a few kilometers. Yields varied, with some being in the sub-kiloton range. Types of tactical nuclear weapons included air-dropped free fall bombs and glide bombs; air-to-surface missiles and air-to-surface standoff missiles; cruise missiles; surface-to-air missiles; shorter-range surface-to-surface missiles; air-to-air missiles; artillery rounds; depth charges; torpedoes; and atomic demolition munitions. [22]

Tactical Nuclear Weapon Dilemmas for the United States

The operational deployment of tactical or battlefield nuclear weapons posed a host of nuclear security and management dilemmas for US leaders and military commanders. An accidental nuclear detonation of a tactical nuclear weapon during peacetime would have resulted in severe strains for alliance relations. Theft of tactical nuclear weapons by criminal organizations or terrorists also could strain alliance ties. The nearness of nuclear assets to the forward edge of the battlefield, where they could be struck or captured by advancing Soviet forces, posed other obvious risks of nuclear escalation. In the earliest phases of the Cold War, safeguards against accidental or unauthorized nuclear detonations of forward-deployed US tactical nuclear assets were minimal by comparison with what were developed in the 1960s and 1970s. One can only speculate what the corresponding nuclear weapon safeguards situation

---

[19] "USSR/Russian Nuclear Warheads, 1949-2002" *Natural Resources Defense Council*, http://www.nrdc.org/nuclear/nudb/datab10.asp.
[20] Arbman and Thornton, *Russia's Tactical Nuclear Weapons, Part 1: Background and Policy Issues*, p. 12.
[21] *Warsaw Pact Military Planning in Central Europe: Revelations From the East German Archives*, Woodrow Wilson Center's Cold War International History Project.
[22] *Tactical Nuclear Weapons: Options for Control*, A UNIDIR report (Geneva: UN Publications, 2000), p. 27.

was in the Soviet Union. Mushroom clouds could have been produced by accidents, unauthorized use, an act of terrorism, or breakdowns in command and control. Mushroom clouds could also have been produced by conventional or nuclear strikes against deployed forces or storage depots.

Dilemmas of Escalation Control

The forward basing of tactical nuclear weapons to counter Soviet conventional advantages opened many different pathways to a nuclear detonation – and any detonation posed significant problems for escalation control. In the event of a detonation during a severe crisis, US and allied leaders would have faced the time-urgent dilemma of determining what happened, and how it happened. A nuclear detonation by whatever means after the outbreak of major conventional warfare would place considerable pressure on decision-making and command and control. In delaying a military response to the detonation while seeking to determine responsibility, US leaders and military commanders would risk massive escalation by the Soviet Union while carrying out their investigation and deliberation.

This scenario presumes a singular detonation, as opposed to an orchestrated Soviet nuclear targeting campaign supporting offensive operations across the dividing lines in Central Europe. One possible reason for a singular detonation, aside from an accident or unauthorized use, could be a "demonstration shot" to signal a militarily superior foe in the theater to stop advancing. Morton Halperin suggested that such an act could be purely symbolic, "to demonstrate the danger that the war might get out of hand – rather than to affect the outcome of the battlefield war." In *Limited War in the Nuclear Age*, Halperin argued

> [T]he response of the enemy might well be on the same level, either a backing down on the basis of this demonstration of seriousness, or a corresponding use of tactical nuclear weapons in an effort to force the enemy to desist. Even in this case both sides are likely to remain concerned with the tactical outcome of the war, as well as with the maneuvering to show seriousness, but they will be much less concerned than they would be if tactical nuclear weapons were used with other purposes in mind.[23]

The dangers of escalation after limited use – assuming that the Kremlin would reject the execution of Soviet war plans calling for heavy nuclear strikes – could easily make a mockery of limited war theory. As Bernard Brodie wrote in *Strategy in the Missile Age*,

> The use of any kind of nuclear weapons probably increases markedly the difficulties in the way of maintaining limitations on war. For one thing it is much easier to distinguish between use and non-use of

[23] Morton Halperin, *Limited War in the Nuclear Age* (New York: John Wiley & Sons, 1963), p. 58.

> nuclear weapons than between the use of nuclear weapons below some arbitrary limit of size and use well above that limit… [B]etween the use and non-use of atomic weapons there is a vast watershed of difference and distinction, one that ought not be cavalierly thrown away, as we appear to be throwing it away, if we are serious about trying to limit war.[24]

Any use of nuclear weapons on the battlefield would pose a "use or lose" dilemma for national command authorities – assuming that command and control arrangements remain intact. A 1972 Brookings report characterized this dilemma in the following way:

> Once the nuclear threshold were crossed, both sides would be under pressure to use their nuclear weapons quickly before they were destroyed, and to use them on targets far beyond the front lines in order to attack the enemy's nuclear launchers, as well as its reserve troops, supplies, airfields, communications, and supply routes. These circumstances would compound the problems of using these weapons in a controlled or measured way – and in particular of limiting exchanges once they had begun.[25]

Dilemmas of Force Protection

Another dilemma inherent in forward-deployed tactical nuclear weapons relates to the vulnerability of these weapons to seizure or precision strikes aided by spotters coming from the other side. In this scenario, the destructive force of US and allied nuclear weapons would be turned against their owners. Storage sites could be subject to terrorist acts or sabotage. Weapons in the field could be overrun during military offensives. Soviet Special Purpose Forces (Spetsnaz) were trained to operate deep behind the forward edge of battle. One of their objectives was to locate opposing means to delivery nuclear weapons, either to facilitate attack by other Soviet forces, or to attack them on their own. Targets of particular interest included mobile missiles, command and control facilities, and air defenses and facilities.[26]

Domestic instability within allied states where nuclear weapons were based was a significant threat to weapons' security. During the course of an April 1967 coup in Greece, military units under the junta's command surrounded a depot of

---

[24] Bernard Brodie, *Strategy in the Missile Age* (Princeton: Princeton University Press, 1959), pp. 323, 326.
[25] Charles L. Schultze, Edward Fried, Alice Rivlin, and Nancy Teeters, eds., "Special Defense Issues," in *Setting National Priorities: The 1972 Budget* (Washington DC: The Brookings Institution, 1971), pp. 96, 99.
[26] Robert Boyd, "SPETSNAZ: Soviet Innovation in Special Forces," *Air University Review* (November/December 1986), available at http://www.airpower.maxwell.af.mil/airchronicles/aureview/1986/nov-dec/boyd.html.

US nuclear warheads, only to withdraw after strong protests from Washington.[27] In the 1974 Cyprus crisis, nuclear warheads were reportedly removed from Greek and Turkish aircraft assigned to Quick Reaction Alert missions, and preparations were made to remove the warheads entirely if the need arose.[28] As a Joint Congressional Atomic Energy Committee report noted:

> The Greco-Turkish war over Cyprus in July 1974 and the consequent overthrowing of the Greek Junta highlighted renewed Congressional concern over the security of weapons which might be deployed in vulnerable and outlying areas in countries where the political situation may become unstable. [29]

US officials were also acutely conscious of the threat of terrorist attacks against nuclear weapon storage sites. A 1975 Department of Defense report, *Nuclear Weapons Security Primer*, described this challenge as follows:

> International terrorism during the past few years has demonstrated that it is a force to be reckoned with. Because of the violent, efficient, and rapid manner by which terrorist acts have been executed, terrorism poses a potential threat to our weapon stockpiles and is driving most of the new security upgrade efforts. [30]

The West German Baader-Meinhof Gang, a radical leftist organization also known as the Red Army Faction, bombed the US Army European Command's headquarters in Heidelberg in 1972, killing two American soldiers. In January 1977, it attacked a US military base in Giessen, reportedly in an attempt to seize tactical nuclear weapons.[31] US officials sought to protect tactical nuclear weapons through site consolidation and heightened security measures.

Dilemmas of Vulnerability and Command and Control

The more tactical nuclear weapons were ready for prompt use, the greater the potential for a breakdown of command and control. The more controls were placed over these weapons for safety and security, the less ready they might be for use when needed. These dilemmas increased in proportion to the seriousness

---

[27] US officials offered assurances that Permissive Action Links and other systems would have prevented unauthorized use, had these weapons been seized. "Symington Finds Flaw In NATO's Warhead Security; Greek Incident Hinted," *New York Times*, November 23, 1970; S.R. Davis, "How Safe Are NATO Missiles? Greek A-incident Surfaces," *Christian Science Monitor*, December 8, 1970; and *Development, Use, and Control of Nuclear Energy for the Common Defense and Security and for Peaceful Purposes*, First Annual Report to the US Congress, Joint Committee on Atomic Energy, 94th Congress, June 30, 1975, p. 23.

[28] J.W. Finney, "Cyprus Crisis Stirred US To Protect Atom Weapons," *New York Times*, September 9, 1974; and "Cooling Off the Nukes," *Newsweek*, August 12, 1974.

[29] *Development, Use, and Control of Nuclear Energy for the Common Defense and Security and for Peaceful Purposes*, Joint Committee on Atomic Energy, op. cit., p. 23.

[30] *Nuclear Weapons Security Primer*, US Department of Defence, April 1, 1975.

[31] Andrew and Leslie Cockburn, *One Point Safe* (Anchor, 1997), p. 1-6.

of a crisis or a military engagement. Increased readiness or dispersal of tactical nuclear weapons during a crisis also increased the possibility that something unexpected or unwanted could happen.[32] In addition, the pre-delegation of authority to use tactical nuclear weapons in the event of combat conditions could improve military responsiveness at the risk of uncontrolled escalation. As Glenn Snyder noted,

> Tactical nuclear warfare is much more likely than conventional warfare to give rise to accidents leading to the inadvertent explosion of full-scale war. Even if NATO planned to fight a conventional war, and the war started at the conventional level, the possession of atomic weapons by the troops on each side would create possibilities of their accidental firing. The chance of accidental firing becomes greater as smaller weapons are developed, because the smaller the weapon, the lower the level of command to which it is likely to be assigned and the larger the number of fingers that will be on atomic 'triggers.' When and if a large number of atomic mortars get into the hands of platoon sergeants, the chance that at least one of them will be fired accidentally or irresponsibly rises almost to certainty, and once one is fired the symbolic strength of the distinction between conventional and nuclear weapons as a criterion for war limitation will have been gravely eroded.[33]

Concerted efforts were undertaken to address concerns over command and control as well as the safety and security of tactical nuclear weapons, most notably by employing Permissive Action Links, or PALs. Notwithstanding these necessary steps, the dilemmas posed by US reliance on tactical nuclear weapons remained very much in place, as noted by a 1987 report by the American Academy of Arts and Sciences and the Cornell University Peace Studies Program:

> In a major conventional war, both sides would have to maintain control over thousands of nuclear weapons, possibly up to the brink of defeat, while the front might be shifting through regions where such weapons are based. Commanders would have to prevent unintended use of any nuclear weapon, and simultaneously prepare their large and diverse arsenals for possible use. These two opposing requirements would have to be met in the face of conventional attacks on the nuclear forces and on their command system.[34]

---

[32] See Daniel Charles, *Nuclear Planning in NATO: Pitfalls of First Use* (Cambridge: Ballinger Publishing Company, 1987).
[33] Glenn Snyder, *Deterrence and Defense: Toward a Theory of National Security* (Princeton: Princeton University Press, 1961), p. 140.
[34] *Crisis Stability and Nuclear War,* A Report Published Under the Auspices of the American Academy of Arts and Sciences and the Cornell University Peace Studies Program (Ithaca: Cornell University, 1987), p. 66.

Forward basing of tactical nuclear weapons demonstrated resolve, alliance solidarity, and deterrence, but at the risk of increasing the vulnerability of deployed nuclear weapons upon the outbreak of hostilities. US political and military leaders rightly worried that Soviet forces would attempt to attack NATO nuclear storage sites in Western Europe. Soviet war planners had good reason to worry about similar tactics, since US Army manuals on tactical nuclear weapons emphasized attacks against known or suspected enemy atomic missile storage and launching sites.[35]

Mutual vulnerability of forward-deployed tactical nuclear weapons was an enduring concern throughout the Cold War. A report by the United Nations Institute for Disarmament Research highlighted this dilemma while alluding to the risks for escalation control:

> In a fast moving battle, the risk of being overrun is particularly great for troops with short-range weapons that are necessarily deployed close to the front line…The vulnerability of TNWs [tactical nuclear weapons], thus, contains an inherent imperative to employ them early in warfare… The shortest-range TNWs especially are thus a factor of grave instability. [36]

Similarly, the 1972 Brookings report described the risks of forward basing as follows:

> Our tactical nuclear force structure is based on the "discrete fire" concept; namely, that tactical nuclear weapons will be fired against specific or known enemy targets, as in conventional warfare, and that they will be controlled and fired from forward positions. This structure is another factor contributing to vulnerability…Hence a major fraction of our launchers would be in a belt within one hundred miles of the front. Both systems would be well within range of the [Warsaw] Pact weapons and thus would be destroyed in an initial attack.[37]

Resource Allocation

Tactical nuclear weapons were championed during the Eisenhower administration as a cost-effective means of defending forward-deployed forces and allies, as well as to compensate for Washington's inability to match Soviet conventional force levels. (Between 1955 and 1961, the US Army's end-strength was reduced by 200,000.[38]) The US Army was initially drawn toward concepts of nuclear operations involving small, mobile forces. In 1956, it adopted the "Pentomic" model to operate on an atomic battleground. Pentomic divisions

---

[35] Rose, *The Evolution of US Army Nuclear Doctrine*, p. 86.
[36] *Tactical Nuclear Weapons: Options for Control*, UNIDIR, p. 27.
[37] Schultze, *Tactical Nuclear Weapons in Europe*, pp. 96, 99.
[38] Bacevich, *The Pentomic Era: The US Army Between Korea and Vietnam,* p. 20.

consisted of five battalions, each made up of five companies. A company in turn consisted of five platoons. The Pentomic model was meant to strike a balance between creating units large enough to fight independently yet small enough so as not to suffer catastrophic losses on a nuclear battlefield.[39] This concept of operations was dropped, in part due to dilemmas of command and control as well as the possibility that an adversary might pursue similar tactics.

A larger concern within the Kennedy administration was the Pentagon's heavy reliance on nuclear weapons at the expense of robust, conventional war-fighting capabilities.[40] Morton Halperin debunked this trade-off between manpower and reliance on nuclear weapons in the following way:

> Probably the most frequently made assertion…about tactical nuclear weapons is that they permit the substitution of technology for manpower…A smaller number of troops, it is argued, have an advantage in the use of weapons with great firepower. Why this would be an advantage is not clear, unless the unstated assumption is that the enemy is not using tactical nuclear weapons or for some reason is using them in a highly inefficient way. [41]

Even before the end of the Eisenhower administration, a consensus was developing that, as Lawrence Freedman chronicled, "nuclear weapons could not be relied upon to reduce manpower requirements."[42] To the contrary, an atomic battlefield would require large forces, as the rates of attrition would be high. Studies and military exercises conducted in the 1950s clarified that a war involving tactical nuclear weapons would place enormous stress on soldiers. Immediate casualties would be high. Survivors would feel disoriented, isolated, and leaderless. Supplies of food and water would be contaminated. Radiation poisoning would be rampant. The Army "found it extremely difficult to work out how to prepare soldiers for this type of battle and to fight it with confidence."[43] Robert Osgood aptly described the dissipation of faith in tactical nuclear weapons in his book, *Limited War Revisited*:

> [C]onfidence in tactical nuclear warfare as a more effective form of local resistance soon waned…Most official studies and war games indicated that, even if it could be limited geographically, a tactical nuclear war in Europe would probably produce such chaos as to be beyond predictable control, that it would devastate the European allies, and that it would require more rather than less manpower. [44]

---

[39] For more on the Pentomic Model, see A.J. Bacevich, *The Pentomic Era: The US Army Between Korea and Vietnam* (Washington DC: National Defense University Press, 1986).
[40] Ibid., p. 76.
[41] Halperin, *Limited War in the Nuclear Age*, p. 65.
[42] Lawrence Freedman, *The Evolution of Nuclear Strategy* (New York: St. Martin's Press, 1983), p. 108.
[43] Ibid., p. 109.
[44] Robert Osgood, *Limited War Revisited* (Boulder, CO: Westview Press, Inc. 1979), p. 21.

US officials concluded that it was fatuous to think of tactical nuclear weapons as a cost-saver. Instead, tactical nuclear weapons diverted scarce resources away from conventional military capabilities.

Soviet Perspectives on Tactical Nuclear Weapons

The Soviet Union was not nearly as concerned about the safety and security or cost dilemmas posed by tactical nuclear weapons as were US and NATO strategists. For example, the prospect of a terrorist attack on a Soviet nuclear weapon storage depot was quite unlikely during the Cold War due to totalitarian controls. Nor did the Kremlin view the problem of escalation control in the same way as US and NATO strategists. Rather than posing problems, tactical nuclear weapons were viewed by Soviet strategists as part of the solution to winning a conflict on the European continent. Western analysts of Soviet military doctrine concluded that, in the view of Soviet military planners, there was a "single escalation boundary" – that between tactical and strategic nuclear weapons. In other words, Soviet planners believed that a nuclear war could be confined to the European theater, as the United States would not be willing to sacrifice its own cities by attacking Mother Russia.[45]

Compared to western writings regarding the dilemmas of escalation control, Soviet writings on this subject are quite sparse. Heavy Soviet reliance on tactical nuclear weapons in the conduct of a military offensive in Europe led to dilemmas of a different sort. To begin with, in order to accomplish a surprise attack, even in a time of heightened tension, the Soviets would need to utilize forces and weapons already in place. If they added additional forces or nuclear weapons, they risked losing the element of surprise. Soviet military planners appeared willing to sacrifice additional numbers for surprise. Striking first, however, meant that tactical nuclear weapons needed to be distributed down to the brigade and battalion levels prior to the offensive. This military imperative was at odds with the Kremlin's priority to maintain centralized political control over nuclear weapons.

Moreover, nuclear strikes needed to be employed in such a way as to facilitate, rather than complicate the ground offensive. Troops would need to operate successfully on an atomic battlefield in which counter-strikes were likely. This presumption was breathtakingly bold and reckless. By posturing for an offensive, front-line Soviet forces and re-supply routes were vulnerable to counter-attacks with nuclear and conventional weapons. Deep NATO strikes could wreak havoc with lines of communication and decimate reserve forces. Soviet military planning sought to overcome these problems with rapid

[45] See Joseph D. Douglass, Jr. and Amoretta M. Hoeber, *Conventional War and Escalation: The Soviet View* (New York: Crane and Russak, 1981); and Joseph D. Douglass, Jr., *The Soviet Theater Nuclear Offensive*, op. cit.

advances, without satisfactorily addressing how advances could be sustained on a radiated battlefield.[46]

POST-COLD WAR ROLES FOR TACTICAL NUCLEAR WEAPONS

In the summer of 1991, as the Soviet Union began to dissolve, Presidents George H.W. Bush and Mikhail Gorbachev decided to unilaterally and reciprocally remove the least safe and secure weapons from their deployed forces. These presidential nuclear initiatives resulted in making the US Army a non-nuclear service. The US Navy removed all of its nuclear weapons from surface ships and submarines, with the exception of submarine-launched ballistic missiles. A smaller stockpile of forward-deployed, air-delivered tactical nuclear weapons remains in place estimated at 1,000 warheads. US tactical nuclear warheads are estimated to be approximately 1,700.[47]

Soviet President Mikhail Gorbachev pledged cuts in the Soviet tactical nuclear weapons arsenal, although US officials have questioned the extent to which Gorbachev's promises have subsequently been kept.[48] President Gorbachev specifically announced that the USSR would eliminate its entire global inventory of ground-launched, short-range nuclear weapons, including nuclear artillery shells, short-range ballistic missile warheads, and nuclear land mines. It would also remove all surface-to-air missile nuclear warheads from combat units. President Gorbachev called, on the basis of reciprocity, for the withdrawal of all nuclear weapons from frontal aviation units, including gravity bombs and air-launched missiles, and for their placement in central storage. He declared that the USSR would remove all naval tactical nuclear weapons, including sea-launched cruise missiles from its surface ships, multi-purpose submarines, and land-based naval aircraft. A portion of these warheads would be destroyed, while the remainder would be centrally stored and available if necessary.

In January 1992, Russian President Boris Yeltsin reiterated and added to Gorbachev's earlier pledges. He stated that production for ground-based tactical missiles and nuclear artillery shells and mines had ceased. Russia would eliminate its stockpiles of nuclear weapons, including one-third of its sea-based tactical warheads and one-half of its weapons for surface-to-air missiles. Russia also intended a one-half reduction in its air force tactical stockpile. Lastly, on a reciprocal basis, the remaining air-based tactical weapons could be removed

---

[46] Ibid.

[47] "Too Many Too Slow: The Bush Administration's Stockpile Reduction Plan," *Natural Resources Defense Council*, http://www.nrdc.org/nuclear/fstockpile.asp.

[48] For a more detailed discussion of these issues, see the primary source for this section of the chapter, Gunnar O. Arbman and Charles L. Thornton, *Russia's Tactical Nuclear Weapons – Part I: Background and Policy Issues*, op. cit. Also see US Director of Central Intelligence, *Soviet Tactical Nuclear Forces and Gorbachev's Nuclear Pledges: Impact, Motivations, and Next Steps (Interagency Intelligence Memorandum)*, NI IIM 91-10006, declassified (formerly classified Secret/NoForn-NoContract-Orcon), November 1991.

from deployment and centrally stored. In June 1992, Russian officials announced their intention to accomplish the elimination of naval warheads by 1995; anti-aircraft missile warheads by 1996; nuclear mines by 1998; and, nuclear warheads of tactical missiles and artillery shells by 2000.[49] Ten years later, however, Russia indicated that its progress toward those goals has not been accomplished.

Alexei Arbatov, a former member of the Russian Duma Defense Committee, estimated in 1999 that the Russian Federation retained approximately 3,800 tactical nuclear weapons, including 200 atomic demolition munitions, 600 air defense missile warheads, 1,000 gravity bombs and short-range air-to-surface missiles, and 2,000 naval anti-ship, antisubmarine, and land-attack weapons.[50] It is not clear whether Arbatov was referring to operationally available tactical nuclear weapons or all weapons in the Russian inventory, including those in storage. Joshua Handler placed the Russian tactical nuclear weapon arsenal at 3,380 warheads in 2002.[51] Another assessment, however, raises the current number of tactical nuclear weapons in Russia to 8,000 warheads.[52]

Today, with dominant conventional military and power projection capabilities and in the absence of a major, standing conventional threat to Europe, the United States has never had less of a need for tactical nuclear weapons. According to calculations of the Natural Resources Defense Council, the Bush administration's June 2004 stockpile management decisions are likely to reduce non-strategic nuclear warheads from 1,703 to 844 by 2012.[53] Alongside these reductions, the Bush administration is considering alterations and new additions to the US arsenal in the form of a Robust Nuclear Earth Penetrator warhead. The administration has defended funding for this "bunker buster" as follows:

> With a more effective earth penetrator, many buried targets could be attacked using a weapon with a much lower yield than would be required with a surface burst weapon. This lower yield would achieve

---

[49] Vladimir Belous, "Nuclear Warheads: What Do We Do? Good Intentions and Harsh Reality," *Nezavisimaya Gazeta*, June 17, 1992, p. 2 [JPRS-UMA-92-026].

[50] Alexei Arbatov, "Deep Cuts and De-alerting: A Russian Perspective," in Harold Feiveson, ed., *The Nuclear Turning Point: A Blueprint for Deep Cuts and De-Alerting of Nuclear Weapons* (Washington DC: The Brookings Institutions, 1999), p. 319. The USSR was estimated by Arbatov to have possessed a total of 22,000 tactical nuclear weapons in 1991.

[51] Joshua Handler, "The 1991-1992 PNIs and the Elimination, Storage, and Security of Tactical Nuclear Weapons," in Brian Alexander and Alistair Millar , eds., *Tactical Nuclear Weapons: Emergent Threats in an Evolving Security Environment* (Virginia: Brassey's, Inc, 2003), p. 31.

[52] From Arbman and Thornton, *Russia's Tactical Nuclear Weapons – Part I: Background and Policy Issues*. The methodology used in this estimate begins with a baseline provided by Alexei Arbatov of 1991 force levels, and then calculates reductions based on official statements of "percentage of 1991/1992 unilateral pledges completed."

[53] "Too Many Too Slow: The Bush Administration's Stockpile Reduction Plan," *Natural Resources Defense Council*, http://www.nrdc.org/nuclear/fstockpile.asp.

> the same damage while producing less fallout (by a factor of ten to twenty) than would the much larger yield surface burst. [54]

The certification of a new tactical nuclear weapon design would require a resumption of US nuclear testing.

As the perceived need and military utility of tactical nuclear weapons have plummeted in the United States, they have grown in Russia. Tactical nuclear weapons are viewed as essential for military contingencies in the east, where Russia is sparsely populated, and where Chinese military capabilities are growing as Russian capabilities decline. Moscow's conventional military deficiencies in both the eastern and western theaters have led to a renewed reliance on tactical nuclear weapons in its military doctrine and the official abandonment of its pledge not to use nuclear weapons first in the event of hostilities.

TACTICAL NUCLEAR WEAPON DILEMMAS IN SOUTH ASIA

Nuclear-armed rivals typically have difficulties in the early stages of their competition in determining opposing capabilities, addressing vulnerabilities, strengthening command and control, and wrestling with the stability-instability paradox.[55] Responsible authorities in India and Pakistan are focusing much attention to these issues. The operative question posed by this essay is whether they will add to their difficulties by adopting plans and programs for short-range, tactical, or battlefield nuclear weapons.

Public declarations by Pakistani and Indian leaders suggest there is reason to hope that the nuclear-armed rivals in South Asia will avoid the pitfalls inherent in reliance on tactical nuclear weapons. Official statements regarding nuclear doctrine stress minimum, credible deterrence and denigrate nuclear war-fighting plans, programs, and postures. There is no question that Indian and Pakistani leaders are determined to avoid Cold War nuclear excesses. They do not have the interest or the resources to build up large nuclear stockpiles. By adhering to a voluntary moratorium on nuclear tests, they have limited their options with respect to the development and induction of new types of warheads, perhaps including miniaturized devices specifically designed for battlefield use. A resumption of nuclear testing, and its spread to South Asia, could remove this constraint.[56]

---

[54] "Nuclear Posture Review [Excerpts]," *GlobalSecurity.org*, http://www.globalsecurity.org/wmd/library/policy/dod/npr.htm.

[55] See Michael Krepon's companion essay, "The Stability-Instability Paradox, Misperception, and Escalation Control in South Asia."

[56] During the June 2004 talks on nuclear confidence-building measures, each side "reaffirmed its unilateral moratorium on conducting further nuclear test explosions unless, in exercise of national sovereignty, it decides that extraordinary events have jeopardized its supreme interests." Joint Statement, Meeting Between Foreign Secretaries of India and Pakistan, June 28, 2004, http://meaindia.nic.in/jshome.htm.

Additional factors reinforce the possibility of restraint in South Asia with respect to tactical, battlefield, or short-range nuclear weapon delivery vehicles. Despite their deep grievances toward each other, India and Pakistan have a history of fighting wars that are quite limited in their duration, scope, and means. Warfare between the armed forces of the two countries has been marked by efforts to avoid collateral damage and indiscriminate suffering. India and Pakistan are neighbors that retain linkages despite the absence of close contact in recent decades. The forward edge of future battles between them could occur in close proximity to population centers. If nuclear weapons are used close to the Kashmir divide or the international boundary, their effects will not respect borders or noncombatants. Shifting winds and seasonal effects will shape the contours of fallout and radiation patterns in unwelcome ways.[57]

To be sure, these factors apply to any use of nuclear weapons on the subcontinent, regardless of their range, means of delivery, and launch location. But the dilemmas associated with nuclear weapons having very short ranges are particularly acute, as are discussed below. Our analysis suggests that the Cold War and South Asian nuclear standoffs present dilemmas associated with tactical nuclear weapons that are different primarily in degree rather than in kind. In our view, the only tactical nuclear weapon rationales that were unique to the Cold War related to alliance management. While neither India nor Pakistan have alliance ties to maintain, the use of nuclear weapons by both countries would still severely complicate relations with neighboring states.

The most prominent applicable dilemma associated with the use of tactical, battlefield, or short-range nuclear weapon delivery vehicle relates to escalation control. Any use of such a weapon - even a singular demonstration shot by the weaker party to signal the urgency of stopping a threatening advance - presents a strong likelihood of uncontrolled escalation. The leadership of the country that is warned by a singular nuclear detonation, including a low-yield detonation in a remote area that does not produce immediate casualties, would need to make momentous, nation-threatening decisions very quickly. Questions would immediately arise as to whether a singular nuclear detonation would be followed quickly by many more, either through a breakdown in command and control or in anticipation of punishing strikes, as the stated nuclear postures of India and Pakistan promise.

As western deterrence strategists concluded, escalation control is far easier below the nuclear threshold than across it. In both circumstances, the

[57] Timothy Hoyt, "The Buddha Frowns? Tactical Nuclear Weapons in South Asia," in Brian Alexander and Alistair Millar, eds., *Tactical Nuclear Weapons: Emergent Threats in an Evolving Security Environment* (Virginia: Brassey's, Inc, 2003), p. 104. Also see Kishore Kuchibhotla and Matthew McKinzie, "Nuclear Terrorism and Nuclear Accidents in South Asia," in Michael Krepon and Ziad Haider, eds., *Reducing Nuclear Dangers in South Asia* (Washington DC: The Henry L. Stimson Center, 2004).

prerequisites of escalation control include properly functioning lines of communication, trust in the messages received, correct calculations of an adversary's intentions, cool-headedness in excruciatingly difficult circumstances, and the ability of national leaders to slow down the clock for decision-making when time is of the essence. The imperative of speedy decisions would fall most heavily on rivals whose nuclear assets are most susceptible to preemption or whose targeting strategy depends heavily on striking quickly.

While the dilemma of escalation control applies to any use of nuclear weapons in South Asia, the potential for this theoretical dilemma to become real increases if short-range nuclear weapon delivery vehicles are deployed on the battlefield. The presence of short-range ballistic missiles near the forward edge of battle would presumably reflect decisions by national leaders to signal resolve and to shore up deterrence. Such deployments might be made in conjunction with official statements of a threatening nature. The side deploying short-range, dual-capable missiles might well seek to project a calculated ambiguity regarding whether the ballistic missile in question has a nuclear or conventional warhead. If deterrence breaks down and conventional fighting ensues around the missile deployments, much will be left to chance.

If a short-range ballistic missile is overrun or successfully destroyed in combat, the weaker party's bluff would be successfully called, especially if the missile in question is armed with a conventional warhead. Other attacks on short-range ballistic missiles could ensue on the presumption that they, too, are conventionally armed. This assumption may or may not be correct. The weaker party would then face the dilemma of how to reinforce deterrence in a deteriorating battlefield situation after one's nuclear bluff has been successfully called.

If, alternatively, short-range ballistic missiles are armed with nuclear weapons during a deep crisis, and if they are deployed close enough to an adversary's forces to damage them or some other target that the adversary holds dear, a breakdown of deterrence would have immediate, catastrophic effects. The trigger for uncontrolled escalation could occur if fighting erupts, if a missile battery is captured, if a local commander exercises a pre-delegated authority to fire the missile, or if command and control arrangements break down. Alternatively, uncontrolled escalation could be triggered before combat begins as a result of an accident relating to deployment or through the actions of an extremist group during the depths of a crisis. These dilemmas are not unlike those that faced the nuclear superpowers during the Cold War. Regardless of how or why a detonation were to occur, the dilemmas of escalation control would be no less acute in South Asia than in Central Europe.

Another generic concern relating to tactical nuclear weapons is that of force protection. In either the Cold War or South Asian cases, there are more

opportunities for something unfortunate to happen when tactical nuclear weapons are forward deployed in South Asia than when they reside in highly secure storage facilities. Because of the numbers of tactical nuclear weapons deployed by the United States and the Soviet Union, the scope of this problem was greater in the Cold War. On the other hand, the scope of something going badly wrong due to the actions of extremist groups is greater in South Asia.

Some of the dilemmas of force protection in South Asia can be addressed by not deploying nuclear warheads mated with their launch vehicles in a crisis, where they could be subject to accidents, seizures, and breakdowns in command and control. If, however, the requirements of rapid response are deemed to be paramount, the dilemmas of vulnerability and maintaining strict command and control will rise to the fore, as was the case during the Cold War. Insofar as vulnerabilities are greater and command and control mechanisms are less robust in the early stages of a nuclear rivalry, the best remedies to these dilemmas are not to have severe crises on the subcontinent, and if crises erupt, not to deploy nuclear-capable forces, especially short-range ballistic missiles.

Future actions by extremist groups in Pakistan and India that could lead to severe crises on the subcontinent cannot be ruled out. The potential for such actions rises if Pakistan remains wedded to a proactive Kashmir policy that rests heavily on *jihadi* groups to punish India and to leverage favorable outcomes. To be sure, acts of terror that trigger a severe crisis could be carried out by groups beyond Pakistan's control. In such circumstances, the ability of Indian authorities to dampen the resultant crisis would depend, in part, on the extent to which Pakistani authorities are perceived to have previously sought to defuse the Kashmir dispute. If a triggering act occurs in the context of increased infiltration and violence across the Kashmir divide, prospects for escalation control are likely to be dim.[58]

It would probably be unwise to assume that future crises on the subcontinent would follow the same script as in the past. Military planning in India is reportedly looking at options that fall between endless patience and full-scale conventional war.[59] Pakistani military planners must take into account India's growing military potential, particularly its improved surveillance and conventional strike capabilities.[60] The extent to which the changing conventional balance on the subcontinent would effect Pakistani decision making with respect to increasing the survivability of nuclear assets in a deep crisis remains a matter of conjecture. If readiness rates are increased in a crisis, one cannot know for certain whether the release authority for the use of nuclear weapons would be

[58] See Michael Krepon and Ziad Haider, eds., *Reducing Nuclear Dangers in South Asia* (Washington DC: The Henry L. Stimson Center, 2004), p. 2-3.
[59] Shishir Gupta, "No Eyeball to Eyeball Any More in New War Doctrine," *Indian Express*, March 6, 2004.
[60] See Rodney Jones' companion essay, "Nuclear Stability and Escalation Control in South Asia: Structural Factors."

pre-delegated or whether strict instructions not to use nuclear weapons might be circumvented in the field. We can assume, however, that sophisticated devices to prevent unauthorized use on the battlefield, such as those developed over time during the Cold War, may not yet be in place.

Another dilemma regarding nuclear weapons is that of resource allocation. In the early stages of the nuclear competition between the United States and the Soviet Union, as between Pakistan and India, some expressed the expectation that nuclear weapons would save money spent for national defense and would permit reductions in conventional forces. These hopes were not realized. Peacemaking, rather than the addition of nuclear weapons into troubled regions, allows for cost savings and reductions in forces. Over-reliance on nuclear weapons to compensate for defense deficiencies usually compounds the dangers associated with the weapons.

Nuclear Stabilization Measures

How serious are Indian and Pakistani leaders in asserting that they do not intend to build nuclear war-fighting arsenals? If these assertions are genuine, and if national leaders wish to demonstrate their intent not to follow the mistakes of other states that possess nuclear weapons, how might they do so?

Intent can be partly demonstrated over time if the pace of nuclear modernization remains leisurely. But even a slow pace of nuclear modernization does not necessarily suggest that countries have abjured nuclear war-fighting strategies and capabilities. Indeed, a country that modernizes its arsenal slowly might also choose to produce short-range or tactical nuclear weapons for battlefield use. In addition, leaders on the subcontinent will be watching closely to see whether declarations that nuclear forces are not deployed are being observed. While non-deployment pledges certainly differentiate India and Pakistan from permanent members of the United Nations Security Council, this, too, would not preclude the production of nuclear weapon systems designed for battlefield use. Besides, distinctions between "deployed" and "non-deployed" nuclear weapon systems might be hard to distinguish – or to put much faith in – during a crisis.

The continued adherence to a moratorium on nuclear testing would also lend credence to declarations by Pakistani and Indian leaders that they do not intend to build nuclear war-fighting arsenals. Nonetheless, both India and Pakistan have already announced tests of low-yield devices in 1998. Thus, a continued moratorium might not preclude the possession, deployment, or potential use of such weapons. Intentions could also be reflected by decisions taken with respect to missile flight tests. The flight-testing of new, short-range, nuclear-capable ballistic missiles would undermine public declarations against nuclear war-fighting concepts, unless other steps were taken to suggest that such weapon systems will not be armed with nuclear weapons. However, it might be difficult – or viewed as unwise – to remove all ambiguity in this regard. Besides,

a message of restraint with respect to the flight-testing of new short-range ballistic missiles might be overridden if the pace of flight-testing of longer-range missiles increases.

This brief and illustrative survey suggests that many measures are available to Indian and Pakistani leaders who wish to signal nuclear restraint and reinforce public declarations against nuclear war-fighting strategies. As helpful as these measures are, none are definitive, and all are reversible. For example, a relaxed pace of nuclear-related development and production could be interrupted as a result of developments outside the region. The moratorium on nuclear testing in the subcontinent could be broken if the United States or another country resumes testing. Nuclear modernization programs could also be accelerated because of developments relating to China that are disturbing to Indian officials.[61] The pace of the nuclear rivalry could also increase as a result of tensions on the subcontinent, or by the actions of extremist groups. It could also be advanced as a result of overly alarmist estimates of opposing nuclear capabilities.

Indian and Pakistani leaders deserve credit for the steps they are taking to reduce nuclear dangers and to avoid the mistakes other nations have made after acquiring nuclear weapons. Still, there is much more that could be done to reduce nuclear danger, as leaders in both countries acknowledge. Additional steps taken to avoid the dilemmas associated with tactical nuclear weapons would add clarity and reinforcement to public pledges of intent to avoid nuclear war-fighting postures. The following measures are proposed for consideration for these reasons, as well as because the military utility of tactical nuclear weapons in South Asia is far, far less than the dangers associated with their possession, deployment, and use.

Declaratory Statements

Declaratory policy is a key element of nuclear postures, and political leaders on the subcontinent often resort to such statements to stress themes and to affirm government policy. One step that might be considered would be joint or separate public declarations by national leaders in India and Pakistan to clarify their intention not to indulge in the pursuit of nuclear war-fighting capabilities, with specific reference to tactical, battlefield, or short-range nuclear weapon delivery vehicles. For example, responsible authorities in both countries might publicly declare that certain short-range missile systems, while capable of carrying both nuclear and conventional weapons, will only carry conventional payloads.[62]

---

[61] For the complex strategic dynamic between India and China, see Ashley Tellis, "China and India in Asia," in Francine R. Frankel and Harry Harding, eds., *The India-China Relationship: What the United States Needs To Know* (New York: Columbia University Press, 2004); and Waheguru Pal Singh Sidhu and Jing-Dong Yuan, *China and India: Cooperation or Conflict?* (Boulder, Colorado: Lynne Rienner Publishers, 2003).

[62] Feroz Khan has suggested this idea in his companion essay, "Nuclear Signaling, Missiles, and Escalation Control in South Asia."

Declarations of this sort would not be verifiable in the likely event that Indian and Pakistani authorities refuse to allow for proximity or intrusive inspections of short-range missile systems. Nonetheless, it might be possible to draw inferences regarding the truthfulness of leadership declarations regarding the absence of nuclear-armed, short-range missile systems by monitoring military exercises, flight-tests, and deployments, should they occur in a deep crisis. This assumes that the security arrangements associated with nuclear-armed weapon systems would be quite different than for conventionally-armed missiles, and that both intelligence establishments would be able to observe these differences.

Might not declarations of this kind be violated in practice? This cannot be discounted, and clues to this effect might be forthcoming during military exercises and deployments during a crisis. Nonetheless, this threat scenario seems unlikely. If national leaders believe that deterrence might need to be strengthened in a deep crisis by deploying nuclear-, rather than conventionally-armed short-range ballistic missiles, or by maintaining an ambiguous posture in this regard, they are unlikely to agree to our proposal. If an unambiguous declaration that certain missiles will only carry conventional weapons is made and then reversed, deterrence cannot be shored up unless the switch is purposefully revealed. But a leader who revokes a national pledge would also undermine his or her credibility, thereby undermining the deterrent one seeks to strengthen. The need to maintain credibility, which provides an essential basis for effective deterrence, as well as the imperative not to forfeit international support in a deep crisis, suggest that pledges regarding conventionally-armed short-range ballistic missiles are likely to be kept.

We acknowledge that, by declaring certain weapon systems as conventionally armed, and then deploying them in a deep crisis, national leaders would make the missile in question a far more attractive target than one whose armament remains ambiguous. This suggests that public declarations that certain missiles are only armed with conventional weapons are conceivable only if national leaders in both countries conclude that the inherent dangers of nuclear-armed, short-range missiles are not "fixable." Conversely, our proposed public declarations are unlikely if national leaders conclude that the liabilities and limitations of such missiles - whether armed with nuclear or conventional weapons - can best be mitigated by maintaining a posture of purposeful ambiguity.

Leadership declarations that seek to place a rival on the defensive are usually designed for political rather than substantive purposes. Alternatively, public declarations can help signal a change in course for bilateral relations, if national leaders sincerely wish to do so. During the Cold War, most declaratory initiatives were for the purpose of point scoring. Occasionally, however, public declarations were used for substantive effect, most notably in the prelude to the conclusion of the 1963 Limited Test Ban Treaty, and when Presidents Ronald

Reagan and Mikhail Gorbachev jointly declared in 1985 that "a nuclear war cannot be won and must never be fought."[63]

In making such a declaration, Reagan and Gorbachev did not change nuclear force postures, targeting plans, and strategic modernization requirements. They did, however, change the tone of superpower relations during a very tense period, and pave the way for subsequent agreements that substantially reduced nuclear danger. Using this example, declaratory statements can have inherent value, but they are far more credible and effective when backed up by actions that lend content and substance to statements of intent.[64]

Flight Test Restraints

How, then, might statements of intent applying pledges not to engage in the pursuit of nuclear war-fighting capabilities associated with tactical nuclear weapons gain more credibility? One way would be for the governments of India and Pakistan not to engage in additional flight tests of certain short-range ballistic missiles.[65] A formal ban or an informal moratorium on flight tests need not require a commonly agreed definition of "tactical," "battlefield," or "short-range" ballistic missiles. Instead, national leaders could publicly designate which existing missile system would not be flight-tested in the future. Alternatively, both sides could agree upon a range limit under which they would not flight-test new or existing ballistic missiles. Agreements of this kind could be tacit or formal.

Such agreements would be predicated on hard-headed assessments that the military utility of short-range ballistic missiles, whether armed with nuclear or conventional warheads, is extremely modest compared to the dilemmas of escalation control, vulnerability, command and control, and resource allocation outlined earlier in this essay. In our analysis, India's conventional military advantages would be complicated, rather than helped, by short-range ballistic missiles. We acknowledge, however, that this argument might not be persuasive to defense research and scientific organizations working on missile programs.

"Giving up" this option may be more difficult for Pakistan, because the forward deployment of short-range ballistic missiles might be viewed in some quarters as reinforcing deterrence when the order of battle is unfavorable. We have argued the opposite case – that deploying short-range, dual-capable ballistic missiles undermines, rather than reinforces, deterrence. By foregoing the option of short-range, dual-capable ballistic missiles, neither side would be impairing its ability to "signal" the other. Indeed, both Pakistan and India are able to signal resolve and to reinforce deterrence in crisis situations by other

[63] "Joint Soviet-United States Statement on the Summit Meeting in Geneva, November 21, 1985," http://www.reagan.utexas.edu/resource/speeches/1985/112185a.htm.
[64] Michael Krepon, Jenny S. Drezin, and Michael Newbill, eds., "Declaratory Diplomacy: Rhetorical Initiatives and Confidence Building" (Washington DC: The Henry L. Stimson Center, 1999).
[65] See Feroz Khan's companion essay in this book.

means, including longer-range missiles, that pose fewer, but still serious, hazards of escalation control, vulnerability, and command and control. We also discount the argument that short-range ballistic missiles might have some utility against prospective Indian missile defenses, because we find it implausible that New Delhi would spend huge sums to tackle the severe problems associated with trying to deploy ballistic missile defenses against short-range missiles.

We recognize that a formal ban or an informal moratorium not to flight test short-range ballistic missiles could be undercut by flight-testing new missiles of somewhat greater range. Tactics of this sort helped to make arms control agreements difficult to negotiate and sustain during the Cold War. The lessons we draw in this regard from Cold War experience is that if national leaders are serious about reducing nuclear danger, they must resolve to counter institutional interests that seek to nullify the value of agreements reached.

Lesser constraints on missile flight tests could also have utility. For example, flight tests for existing and new missile programs could continue, but under conditions that increase stability and that begin to lay the groundwork for long-distance, cooperative monitoring. Meeting in an unofficial "Track II" setting convened by the Henry L. Stimson Center, a distinguished group of Pakistani and Indian colleagues suggested consideration of the following measures in this regard: formalizing and properly implementing an existing, informal accord relating to the prior notification of missile launches; extending and properly implementing the time-line given for prior notification of missile flight tests; agreeing not to carry out missile flight tests in the direction of the other country; agreeing to flight test missiles only from designated test ranges and updating the lists of designated test ranges on a regular basis; and providing advance notification of the movement of missiles for training purposes. This group discussed additional accords barring the flight-testing of missiles during a crisis, or the number of missiles that could be flight-tested during a particular period of time, but concluded that these constraints were unlikely to be endorsed.[66]

Dismantling, Storing or Constraining Existing Missiles

A far more dramatic gesture to signal disinterest in developing, producing, or relying upon tactical nuclear weapons and nuclear war-fighting strategies would be to dismantle and destroy existing short-range ballistic missiles, either by designated type or by a mutually agreed range threshold. In the latter case, any ballistic missile flight tested at the agreed range or lower would be subject to dismantlement and destruction. This approach, however, could engender disputes over the demonstrated ranges of a particular class of missiles, and may need to be reinforced by flight test and range-monitoring capabilities that are not yet indigenous to the region. Relying on third parties to monitor and determine

[66] Michael Krepon and Ziad Haider, eds., *Reducing Nuclear Dangers in South Asia* (Washington DC: The Henry L. Stimson Center, 2004) p. 1, 15.

range limits is likely to be a sensitive subject and could further complicate such an ambitious agreement.

Alternatively, each side could designate a particular class or classes of missiles to be subject to dismantlement and destruction. In a companion essay, Feroz Khan advocates this approach, suggesting that Pakistan and India each designate their shortest-range ballistic missile systems - the *Hatf I* and the *Prithvi I* - for a missile-specific accord.[67] The rationale for such an agreement would be the same as for the other ideas offered in this section, but the proposed remedy would be more dramatic. An agreement of this type could be formal or informal and reciprocal.

There are many obstacles that stand in the way of such an accord. Powerful institutional interests and domestic constituencies in both Pakistan and India might be opposed to dismantling any missiles that are a source of national pride, even if they have marginal military utility and pose significant dilemmas on the battlefield. An agreement of this sort might be viewed as a significant step leading to a "slippery slope" that increasingly constrains military options. As noted above, concerns of weakening deterrence and military flexibility against a conventionally superior adversary might well be voiced in Pakistan. Those who view ground-based, forward deployed, ballistic missiles as having a greater deterrent value than nuclear-capable aircraft that are based away from prospective battle lines are unlikely to support this proposal. Concerns over constraining conventional military options and improved versions of existing missile systems might also be raised in India.

Verification would also be a thorny issue for an agreement of this kind. It would be difficult to affirm that all missiles of a designated class have been offered for dismantlement and destruction, and it is unlikely that either side would be willing to permit intrusive, challenge inspections to verify compliance. Reliance on third parties for verification, as noted above, also appears unlikely. The belated, sudden appearance of a banned missile might not have military significance, but could raise substantial political barriers to new accords, no matter how well designed and verifiable.

A less dramatic, but still highly symbolic, accord can be envisioned that sidesteps problems of verification. We have in mind an agreement to maintain existing classes of missiles, or missiles below a certain range threshold, in the inventories of Pakistan and India for as long as both sides see fit. However, national leaders in both countries could pledge publicly not to deploy such missiles, even in times of heightened tension.

An agreement of this sort faces long odds. Non-deployment pledges would face stiff opposition on the grounds that any weapon deemed necessary to

[67] See Feroz Khan's companion essay, "Nuclear Signaling, Missiles, and Escalation Control in South Asia."

produce and maintain ought not to be prohibited from appearing on the battlefield. Definitions of what constitutes "deployment" and "non-deployment" might vary, and a non-deployment ban might not be honored during a crisis.

Another alternative approach would be to designate zones in proximity to the Kashmir divide and the international border within which missiles of a particular kind, or of any kind, would not be located. An agreement along these lines would signify disinterest in nuclear war-fighting postures, and appreciation for the dilemmas of escalation control. Its rationales and downside risks are not unlike the other proposals discussed in this essay, although mitigated somewhat because this type of agreement would permit inventories, new production, and flight-testing of missiles. Verification of this accord, as with verification of a flight test ban or moratorium, should not pose insuperable difficulties.

A "missile-free zone" agreement would be politically sensitive, not only because of military considerations, but also because it might suggest, in the view of some, an endorsement of the existing *status quo* along the Kashmir divide. Specific language could address this concern by stating that such an agreement would not prejudice national positions on Kashmir nor effect in any way a final settlement of this issue. If political and military concerns could be alleviated, careful consideration would need to be given to the width of the missile-free zone, which need not be uniform along its entire length. Targeting concerns would presumably not be paramount in such calculations, since both countries possess longer-range missiles and combat aircraft that offer far greater targeting flexibility than short-range missiles.

CONCLUSION

Some of the proposals we offer here are modest, but extremely useful. The more ambitious proposals we outline will require considerable political will to enact over the resistance of powerful interest groups. For those who dismiss out-of-hand the likelihood of ambitious agreements that seriously constrain and even eliminate missile systems, we would point to the 1987 treaty concluded by Presidents Reagan and Gorbachev to eliminate not only land-based, short-range ballistic missiles, but also land-based, medium- and intermediate-range ballistic and cruise missiles.

To be sure, the circumstances surrounding the negotiation of the "INF" Treaty were unique. The treaty was backed up by intrusive verification – including on-site monitoring of missile bases and production facilities. Nonetheless, concerns over verification remained high. Because the force structure of both sides was different, serious concerns were also raised about how equitable the treaty's obligations were. The nuclear options that were given up by both superpowers were quite considerable, which engendered much resistance by the national security establishments of both countries – even though after sweeping several categories of missiles off the nuclear chess board, both superpowers retained huge nuclear arsenals.

We do not mean to suggest that the INF experience and outcome is directly translatable to South Asia. Instead, we seek to draw a more general parallel concerning nuclear rivalries. Regardless of the state of the nuclear competition or the size of nuclear arsenals, national security establishments and "strategic enclaves" will be loath to constrain military flexibility and nuclear options. It is the responsibility of national leaders to weigh these concerns against broader imperatives to reduce nuclear dangers.

Nuclear rivalries do not spring out of the ether. They are a reflection of serious differences and competing objectives. In managing a severe rivalry amidst nuclear danger, military capabilities play an essential role, but they are insufficient to ensure public safety. Diplomatic engagement that leads to agreed "rules of the road" and nuclear risk-reduction agreements is also essential. During the Cold War, engagement as well as containment worked in tandem to manage successfully a severe strategic rivalry. In their own way, India and Pakistan are now pursuing diplomatic engagement while modernizing and adjusting their military capabilities to a nuclearized environment. In this extended process, tensions are unavoidable between those who wish to maintain and enhance nuclear options, and those who see value in mutual restraint.

The dual dynamic of engagement and containment has no set equilibrium point. Dangers are present in seeking the right balance, or in losing one's balance. Other dangers lurk in the shadows – unexpected events arising from accidents, limited or faulty intelligence, the misreading of one's rival, or being hijacked by the agendas of extremist groups.

The United States and the Soviet Union were very fortunate to avoid a nuclear disaster during the Cold War. Generally speaking, the nuclear weapons that were most susceptible to disasters of various kinds were those most closely positioned near harm's way, with the shortest range and the smallest yields. Whether we call these weapons tactical, battlefield, or short-range nuclear weapons, the dilemmas they pose apply to all nuclear rivals that are unwise enough to rely upon them. National leaders in Pakistan and India have pledged not to repeat the mistakes of other nuclear-armed nations. They have an opportunity to demonstrate their opposition to nuclear war-fighting strategies and capabilities by agreeing to measures to clarify this intention. Tactical nuclear weapons are poorly suited for military purposes in South Asia, and well suited for nuclear risk-reduction measures.